3.0

FACILITY DESCRIPTION AND LOCATION

This section provides a complete description of the PEF project. The proposed project is an addition to the existing Pastoria Energy Facility (PEF) described in 99-AFC-7. The PEF Expansion consists of a nominal 160 MW simple cycle unit and associated auxiliaries. The PEF Expansion requires no modifications to the existing PEF linear facilities outside the project site (e.g., electric transmission, fuel gas supply pipeline, or water supply line).

The PEF Expansion area is located entirely within the existing PEF site boundary. The PEF Expansion will utilize the existing PEF administration and control, warehouse and shop, and water treatment buildings. The PEF Expansion will use the same site access and roads that serve the existing PEF.

The PEF Expansion shares common auxiliary equipment and facilities with the PEF Project. These systems include fuel gas filter separator and metering facilities, and water treatment and wastewater treatment systems, including the zero liquid discharge wastewater treatment system.

A more detailed description of the PEF Expansion shared common auxiliary equipment and facilities within the existing PEF is included in Attachment A, Project Description Materials, appended to this application.

3.1 INTRODUCTION

The PEF Expansion is conceptualized as a single combustion turbine generator (CTG) operating in simple cycle mode. The CTG is a single-shaft advanced heavy-duty frame F-class combustion turbine generator. The CTG will be part of a new power block within the existing PEF. It will consist of an exhaust stack generator step-up transformer, air emission reduction equipment, and auxiliary equipment to connect the power block with existing PEF systems (water supply for CTG cooling, electric transmission, fuel gas supply, water treatment chemicals, site access, stormwater control, operational safety systems, sanitary sewer, and potable water). The PEF Expansion plant configuration is illustrated on Figure 3.1-1.

Location. The PEF Expansion area is entirely within the existing PEF site boundary, which is located just north of the Tehachapi Mountains. The PEF Expansion:

- Makes beneficial use of land reserved for this future unit on the existing PEF site.

- Uses the existing PEF interconnection to the SCE transmission system at the Pastoria Substation to provide power to southern California. Connecting at Pastoria, the flow of electricity will travel predominantly to the south without affecting Path 15 or Path 26.
- Makes use of the existing PEF natural gas supply pipeline to provide PEF Expansion with a reliable supply of high pressure natural gas with no modification.
- Provides needed peaking capacity for the SP-15 market.

The PEF Expansion area will encompass approximately two acres of the 31-acre parcel of land that is owned by Tejon Ranchcorp and committed by lease option to Pastoria Energy Facility, LLC. The proposed facility is illustrated on Figure 3.1-1 (PEF Expansion General Arrangement), Figure 3.1-2 (Photograph of Existing PEF), Figure 3.1-3 (Photograph Showing Location for PEF Expansion Facilities within the Existing PEF), and Figures 3.1-4 and 3.1-4A (Location of Existing PEF Components) of this application. Additionally, Section 3.0 from 99-AFC-7, included for reference in Attachment A of this application, includes numerous figures depicting the existing plant area on aerial photography and topography (Figures 3.1-5 through 3.1-7). The site is approximately 30 miles south of downtown Bakersfield, California, and approximately 6.5 miles east of Grapevine, California. No known urban type of development is presently planned within five miles of the plant site. Access to the power plant site is provided from Edmonston Pumping Plant Road via a Plant Access Road constructed as part of the existing PEF.

PEF, LLC will develop, design, construct, own, and maintain the nominal 160 MW power plant. Electrical energy will be sold into the ISO energy and capacity markets or through bilateral agreements to customers connected to the WECC interconnected transmission grid.

The locations of the linear facilities for the existing PEF project are shown on Figures 3.1-4 and 3.1-4A. A complete description of the existing PEF, including maps and figures, can be found in Attachment A, Project Description Materials, of this application. In addition, all relevant application materials from 99-AFC-7 are appended to this application in Volume II, Reference Documents.

The PEF Expansion will utilize the existing PEF water supply and treatment system. The CTG unit will require approximately 66,000 gallons of water per day. Water supplied to the project will be used for CTG inlet evaporative cooling and for CTG auxiliary cooling.

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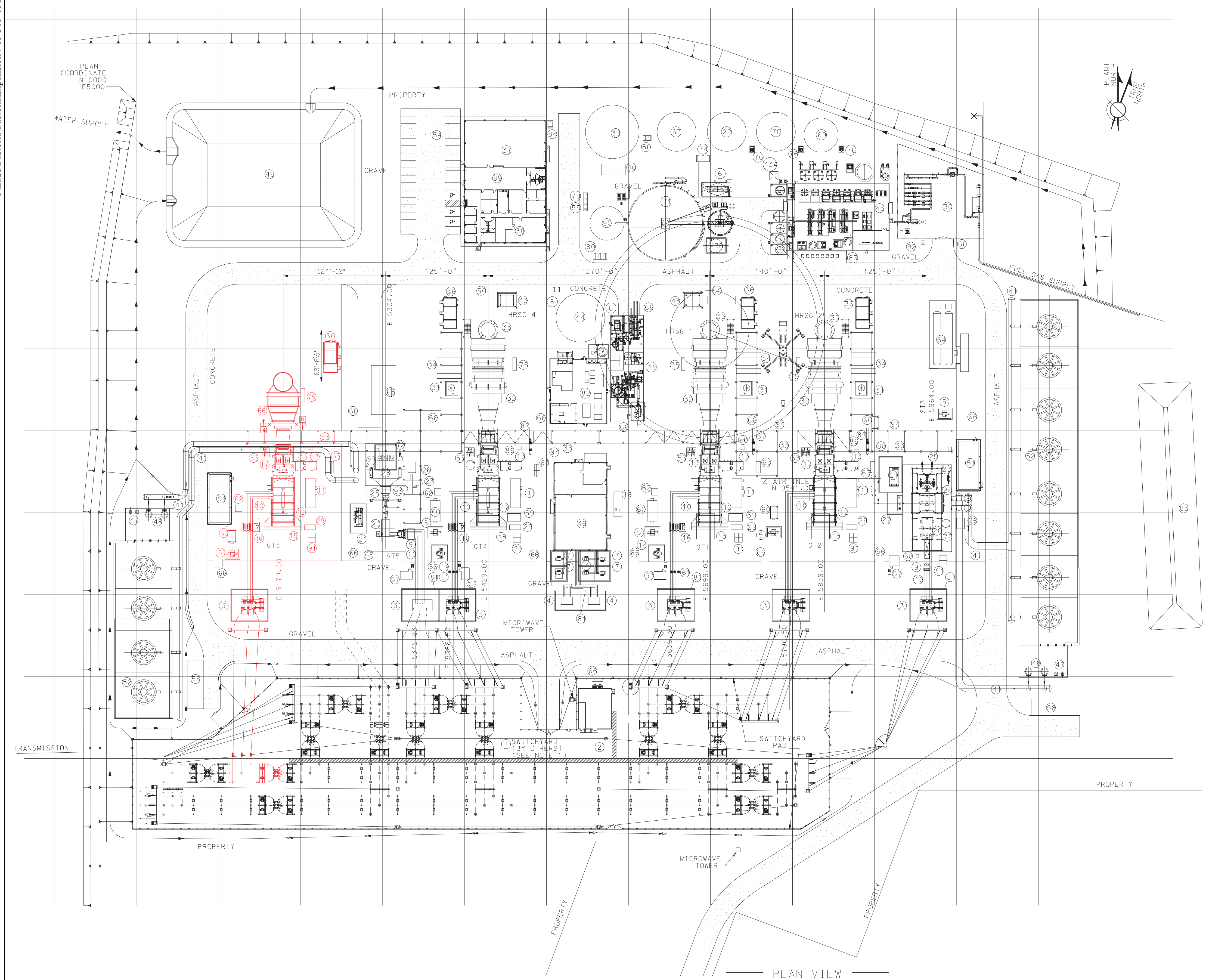

GENERAL NOTES

NEW EXPANSION EQUIPMENT SHOWN IN RED.

LEGEND

1. ELECTRICAL SUBSTATION AREA
2. PLANT SWITCHYARD CONTROL BUILDING
3. GENERATOR STEP-UP TRANSFORMER
4. UNIT AUX. TRANSFORMERS
5. EXCITATION TRANSFORMER
6. FILTER PRESS
7. 480V TRANSFORMERS
8. DEMINERALIZED WATER PUMPS
9. ST GENERATOR VT & SURGE CUBICLE
10. ISO-PHASE BUS DUCT
11. PACKAGED ELECTRICAL AND ELECTRONIC CONTROL CENTER (PEECC)
12. GT GENERATOR
13. GT AUXILIARY PACKAGE
14. ISOLATION TRANSFORMER (1475)
15. GAS TURBINE AIR INLET FILTER
16. GENERATOR BREAKER
17. GAS TURBINE (GT)
18. STANDBY NATURAL GAS EMERGENCY GENERATOR
19. BRINE CONCENTRATOR & CRYSTALIZER EQUIP
20. ST GENERATOR
21. STG LUBE OIL SKID/HYDRAULIC POWER UNIT
22. HERO WASTE TANK (450,000 GAL.)
23. GLAND STEAM CONDENSER/EXHAUSTERS
24. DEMINERALIZED WATER TRAILER
25. STEAM TURBINE (ST)
26. CONDENSER VACUUM PUMPS
27. CONDENSATE PUMPS
28. CONDENSER
29. FOGGING SYSTEM
30. FUEL GAS CNTRL VLVE STATION & INLET SCRUBBER
31. HR BLOWDOWN TANK
32. STEAM GENERATOR (HRSG)
33. FUEL GAS COALESCING FILTERS
34. BOILER FEED PUMPS
35. HRSG STACK
36. CEMS/HR CONTROLS/DELUGE BUILDING
37. WAREHOUSE
38. ADMINISTRATION
39. RAW WATER/FIRE WATER STORAGE TANK (850,000 gal)
40. FIRE PUMPS
41. CIRCULATING WATER PIPING
42. CABLE TRENCH
43. EQUIPMENT DRAIN SUMP
43A CHEMICAL SUMP
43B WASTE RECYCLE SUMP
44. DEMINERALIZED WATER STORAGE TANK-750,000 GAL
45. WATER TREATMENT BUILDING
46. DETENTION POND
47. AUXILIARY COOLING WATER PUMPS
48. CIRCULATING WATER PUMPS
49. MAIN ELECTRICAL EQUIPMENT BLDG
50. OIL/WATER SEPARATOR
51. STG/COOLING TOWER ELECTRICAL EQUIPMENT BLDG
52. COOLING TOWER
53. GT DRAIN SUMP
54. SEPTIC SYSTEM/LEECH FIELD
55. POTABLE WATER PUMPS
56. SERVICE WATER PUMPS
57. FIRE PROTECTION DELUGE HOUSE
58. COOLING TOWER CHEMICAL STORAGE
59. CTG WATER WASH SKID
60. LCI/GENERATOR EXCITATION COMPARTMENT INCLUDES GENERATOR EXCITATION FOR 1 CTG
61. CABLE TAP BOX
62. DC LINK REACTOR
63. FIRE PROTECTION CO2 SKID
64. AMMONIA STORAGE TANKS
65. OWNER SUPPLIED BULK HYDROGEN STORAGE
66. ELECTRICAL MANHOLE
67. EQUALIZATION TANK (500,000 GAL)
68. NEUTRAL GROUNDING TRANSFORMER/RESISTOR CUBICLE
69. WAC WASTE TANK (200,000 GAL)
70. NaZ WASTE TANK (300,000 GAL)
71. REACTOR CLARIFIER
72. DEAERATOR
73. SLUDGE THICKENER
74. EQUALIZATION FORWARDING PUMPS
75. AMMONIA INJECTION SKID
76. WASTE TRANSFER PUMPS
77. CHEMICAL AREA
78.
79. SERVICE WATER PUMPS
80. COOLING TOWER MAKE-UP PUMPS
81. FIRE WALL
82. ZLD BUILDING
83. MIXED BED TANKS
84. TRASH RECEPTACLE
85. RETENTION POND
86. FUEL GAS SCRUBBER
87. FUEL GAS PERFORMANCE HEATER
88. BOILER FEED WATER LEAK DETECTION VESSEL
89. MAINTENANCE SHOP
90. CLEARWELL
91. CO2 AND HYDROGEN BOTTLE RACKS
92. FUEL GAS HYDROCARBON FLASH/STORAGE TANK
93. STEAM TURBINE DRAINS TANK
94. FUEL GAS ELECTRIC HEATER
95. FIN-FAN COOLER

60 30 0 30 60 90 120

SCALE

1" = 60'-0"

Pastoria Energy Facility Expansion	Source: CALPINE® Drawing #PA-GEN-DC-C1-0001 Rev A Dated: 2/25/05	**Figure 3.1-1.** PEF EXPANSION GENERAL ARRANGEMENT	April 2005

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Pastoria Energy Facility Expansion

Source: CALPINE®

Figure 3.1-2. PHOTOGRAPH OF EXISTING PEF FROM PLANT ACCESS ROAD

April 2005

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View from top of existing unit (southwest) to PEF Expansion Site

View from top of existing cooling tower (southeast) to PEF Expansion Site

Pastoria Energy Facility Expansion	Source: CALPINE®	**Figure 3.1-3.** PHOTOGRAPHS SHOWING LOCATION OF PEF EXPANSION FACILITIES	April 2005

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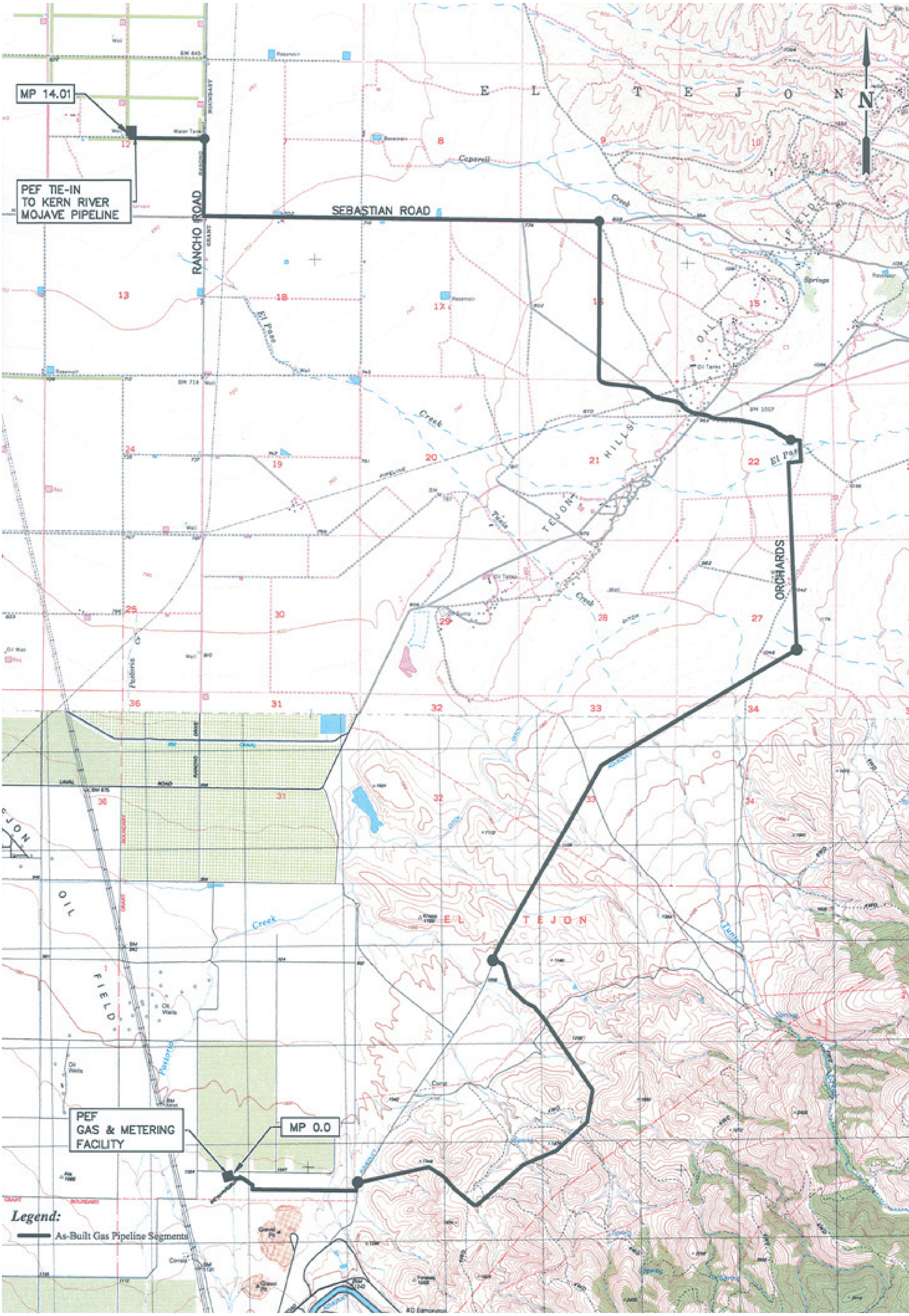
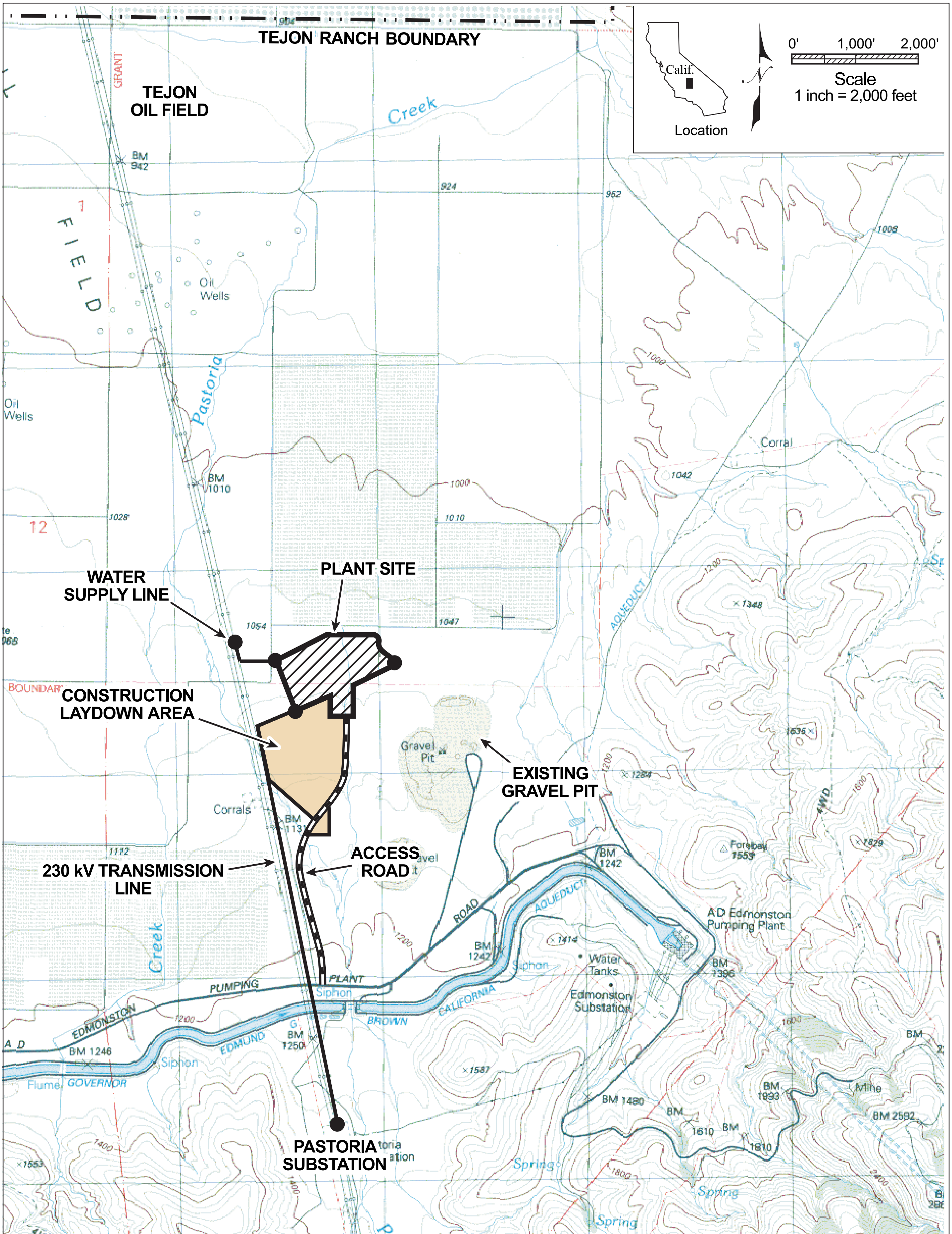


Pastoria Energy Facility Expansion	Source: SPEC SERVICES	**Figure 3.1-4.** LOCATION OF EXISTING PEF FUEL GAS SUPPLY PIPELINE	April 2005



Pastoria Energy Facility Expansion

Source:
U.S.G.S. 7.5' topographic quadrangle: Pastoria Creek, CA
Copyright (c) 1997 Horizons Technology, Inc.

Figure 3.1-4A. LOCATION OF EXISTING PEF WATER SUPPLY PIPELINE AND TRANSMISSION LINE

April 2005

The existing PEF zero liquid discharge wastewater treatment system will be used by the PEF Expansion project for the disposal of any wastewater generated in the production of demineralized water for the CTG inlet evaporative cooling system.

Stormwater will be controlled and collected onsite using surface drainage as well as interfacing with the existing PEF underground drainage and collection system. The existing PEF oil-water separator will be utilized as required to process runoff from equipment locations. Stormwater will be discharged to the existing PEF onsite storm water detention pond. Stormwater that does not infiltrate into the soils or evaporate will be discharged to Pastoria Creek in accordance with applicable regulations and in coordination with Tejon Ranch.

Stormwater and wash water collected from plant equipment drains that may contain miscible chemicals will be directed to the existing PEF oil-water separator. Skimmed oil from this oil-water separator will be collected and sent off-site for disposal. Clear water will be discharged to the existing PEF wastewater collection and processing system.

Sizing of the existing PEF ponds and separator are in conformance with applicable state and local standards and are not significantly impacted by the addition of PEF Expansion.

The PEF Expansion will include the installation of a circuit breaker in an empty bay of the existing PEF 230 kilovolt (kV) switchyard to accommodate the connection of the CTG. The PEF Expansion will use the existing electrical transmission system.

The project will use the existing 14.01-mile PEF 20-inch diameter fuel gas supply pipeline, with no modifications to the pipeline required. Fuel gas will continue to be provided to the plant from the interstate pipeline owned jointly by the Kern River Gas Transmission Company and the Mojave Pipeline Company.

Figures 5.13-1 and 5.13-2 are photo-simulated renderings of the site and adjacent area with the PEF Expansion superimposed (refer to Section 5.13).

3.2 FACILITY LOCATION

The PEF Expansion area is located entirely within the boundaries of the existing PEF site boundary. No additional land will be required to complete the PEF Expansion project. The Legal Description for the existing PEF site is provided in Section 3.2.2 for completeness of this application.

3.2.1 General Location

The PEF Expansion area is located on approximately two acres reserved for future expansion entirely within the 31-acre PEF site boundary. The PEF site is located on Tejon Ranch Property, approximately 30 miles south, southeast of Bakersfield, California, and 6.5 miles east of Grapevine, California. Access to the power plant site will be provided from Edmonston Pumping Plant Road via the existing PEF Plant Access Road constructed as part of the existing PEF project. Edmonston Pumping Plant Road is accessible from Interstate 5 (See Figures 3.1-2, 3.1-3, 3.1-4, and 3.1-4A that show the existing PEF facilities).

3.2.2 Legal Description

As part of 99-AFC-7, the Applicant, in cooperation with Tejon Ranchcorp, processed a Tentative Parcel Map to Kern County (PM 10694). The Parcel Map (PM 10694) is appended to this application within Attachment I, Land Use Materials.

The existing PEF is described as follows:

Being a portion of Parcel 14-13 of Parcel Map No. 3338, as recorded in Book 17 of Parcel Maps at Page 78, in the office of the Kern County Recorder, County of Kern, State of California, being a portion of Section 7, Township 10 North, Range 18 West, S.B.M., in the unincorporated area of Kern County, State of California, and also being a portion of Lot 37 of Rancho El Tejon, as patented to Jose Antonio Aguirre and Ignacio Del Valle by patent recorded in Book 2 of Page 24 of Patents, in the unincorporated area of Kern County, State of California, being more particularly described as follows:

Commencing at the southwest corner of said Parcel 14-13, thence along the South line of said Parcel 14-13, South 89°27’13” East, a distance of 230.44 feet to the True Point of Beginning; thence departing said South line, South 20°27’19” East, a distance of 398.49 feet; thence North 69°32’41” East, a distance of 596.17 feet; thence South, a distance of 304.94 feet; thence East, a distance of 190.45 feet; thence North, a distance of 284.67 feet; thence East, a distance of 156.40 feet; thence North, a distance of 216.97 feet; thence North 69°32’41” East, a distance of 627.13 feet; thence North 34°26’47” East, a distance of 177.82 feet; thence North 55°27’19” West, a distance of 497.44 feet; thence South 87°38’11” West, a distance of 429.02 feet; thence North 20°27’19” West, a distance of 195.81 feet; thence South 69°32’41” West, a distance of 1033.11 feet; thence South 11°03’47” East, a distance of 222.23 feet; thence South 20°27’19” East, a distance of 284.10 feet to the True Point of Beginning.

3.3 SITE DESCRIPTION

This section describes the existing PEF site. The PEF Expansion area is a two-acre area located entirely within the existing PEF site as shown on Figure 3.1-3 (in a vacant area located between the existing power block and the cooling tower), therefore the topography, geology, and hydrology are as described in 99-AFC-7. All relevant application materials from 99-AFC-7 are appended to this application as Volume II, Reference Documents.

3.3.1 Topography

The PEF plant site is located at the southerly end of the San Joaquin Valley at the foot of the Tehachapi Mountains on property owned by the Tejon Ranchcorp.

The PEF site is relatively flat, with a gentle slope running from the southeast to the northwest. The final site grade is at approximately 1,069 feet elevation.

Pastoria Creek, located approximately 1,000 feet west of the existing PEF site, is the natural drainage path for winter and spring runoff. The approved PEF AFC (99-AFC-7) addressed the issues and impacts of site development on Pastoria Creek and the 100-year flood plain. Information on the hydrologic conditions of Pastoria Creek is contained within Section 5.4 of 99-AFC-7, and appended to this application as part of Attachment E, Water Resources Materials. The PEF Expansion will not require additional site grading.

3.3.2 Geological Setting and Seismology

The geology, seismic setting, and soil conditions at the existing PEF site and along the project linear facilities are discussed in detail in the Geological Hazards and Resources Section 5.3 of 99-AFC-7 and the Geotechnical Report from 99-AFC-7. These materials are appended to this application as Attachment C, Geological Hazards and Resources Materials. A summary of this information is provided below.

The existing PEF site and linear facilities are located at the southern end of the Great Valley Physiographic Province of California. Information on the Great Valley Province and surrounding physiographic provinces is included in Attachment C. Attachment C also details the major active and potentially active geologic faults and instrumentally recorded earthquakes within about 100 kilometers of the site. A geotechnical investigation was also conducted for the project area as part of 99-AFC-7. The results of the investigation are also included in Attachment C.

3.3.2.1 Subsurface Conditions

A subsurface exploration program consisting of seven borings (35 to 100 feet deep) and nine test pits (10 to 14 feet deep) was completed at the PEF site in November 1999 as part of 99-AFC-7. A report of the investigation, which also included downhole seismic velocity measurements in one of the 100-foot borings, and an infiltration test in a tenth shallow pit, is presented as Appendix L of 99-AFC-7 (included in Attachment C to this application).

All of the borings and test pits encountered gravelly sands that make up the alluvial fan of Pastoria Creek. These deposits consist mainly of well-graded, coarse-grained sands with a gravel content of 30 to 60 percent. Gravels observed in borings, which were drilled by percussion casing hammer methods, ranged in size up to six inches. Larger gravels, up to 18 inches across, were observed in test pits. Some thin layers of silty sand with very little gravel, were observed in the borings.

Blow count values from sampling in borings indicated that the soil was dense to very dense below a thin surficial layer of less dense soil (less than 5-feet thick). Because blow count values are often inaccurate in gravelly soils, a downhole seismic survey was conducted. The results of that survey are as follows:

Compressional Depth-feet	Shear Wave Wave Velocity, fps	Velocity, fps
5-16	1,350	600
16-60	2,350	1,540
60-100	3,950	2,170

The velocities shown above indicate that soils below 16 feet are considered to be dense. Soils in the upper 16 feet are not as dense as suggested by the blow counts.

The infiltration test, conducted at a depth of two feet at the site of the proposed septic tank leach field, produced a vertical infiltration rate of about ten feet per day.

Refer to Attachment C, Geological Hazards and Resources Materials, appended to this application (Section 5.3 and Appendix L of 99-AFC-7) for more information on the geology and subsurface conditions at the project site.

3.3.2.2 Seismic Conditions

As noted above, the site seismicity is discussed in detail in Attachment C, Geological Hazards and Resources Materials, appended to this application. A summary of this information is provided below.

Several large active faults are located within the site region. Strong seismic shaking has been experienced in the site vicinity due to previous earthquakes associated with several of those active faults. It is virtually certain that the site will experience strong seismic shaking due to future earthquakes.

The strongest earthquake recorded in the region, referred to as the Bakersfield Earthquake, occurred in July 1952 and was centered between the site and Bakersfield on the White Wolf Fault.

The Bakersfield Earthquake caused heavy damage to structures in populated areas, broke pipelines, bent railroad rails beyond use, and caused ground rupture in several places. The ground rupture was due primarily to reverse left lateral movement on the White Wolf Fault zone, which in some areas was observed to be several hundred feet wide. Other ground failures were associated with landslides caused by the shaking, liquefaction in areas of shallow groundwater, loose soils, including those crossing lower Comanche Creek (on fuel gas supply pipeline Route 3), and differential settlement in areas of variable density soils.

Significant shaking has occurred in the site area as a result of other earthquakes such as the 1857 Magnitude 8+ Fort Tejon Earthquake and the 1994 Magnitude 6.8 Northridge Earthquake. The population of the area was nearly zero in 1857; consequently, if ground failure did occur, it was unreported. During the 1994 earthquake, shaking intensity of VII (very strong) was reported south of Bakersfield, however, no damage was reported.

3.3.3 Hydrological Setting

The average annual rainfall, as measured at a station in Lebec, is 11.21 inches. The wettest month is March with an average rainfall of 2.0 inches. The 50-year maximum one-day rainfall is estimated to be 2.0 inches. July is the driest month, averaging 0.05 inch (*Hydrology Manual*, Kern County Department of Planning & Development Services).

3.3.3.1 Surface Water

Rainfall produces surface water runoff from the site and surrounding areas. The site is on the alluvial fan of Pastoria Creek. Pastoria Creek is a small stream that drains out of the Tehachapi Mountains; its primary channel runs in a northerly direction west of the site. The site sheet flows to the north and west.

As part of the development of the existing PEF site, a Hydrological Study was prepared to define flood limits and elevations. This study, accepted by Kern County, more accurately defined the flood plain limits and included grading and drainage strategies for the existing PEF to protect the site from flood waters associated with Pastoria Creek.

3.3.3.2 Groundwater

Groundwater levels in the area of the project are generally greater than 180 feet deep. The adjacent gravel pit is approximately 100 feet deep and has not encountered groundwater. The onsite geotechnical investigations conducted for 99-AFC-7 drilled to a depth of 100 feet and did not encounter groundwater.

3.4 FACILITY DESCRIPTION

This section describes the PEF Expansion project. The proposed project is an addition to the existing PEF described in 99-AFC-7. PEF Expansion consists of a nominal 160 MW simple cycle combustion turbine generator (CTG).

The PEF Expansion area is entirely within the existing PEF site boundary. The PEF Expansion will use the same site access and roads that serve the existing PEF.

The PEF Expansion shares common auxiliary equipment and facilities with the existing PEF as described in 99-AFC-7. These systems include fuel gas filter separator and metering facilities, and water treatment and wastewater treatment systems, including the zero liquid discharge wastewater treatment system.

The PEF Expansion requires no modifications to the existing PEF offsite linear facilities (e.g., electric transmission, fuel gas line or water supply line).

A more detailed description of the shared common auxiliary equipment and facilities from the existing PEF is included in Attachment A, Project Description Materials, appended to this application.

3.4.1 Overview

The PEF Expansion project incorporates one new, natural gas-fired, F-class combustion turbine generator (CTG) operating in simple cycle mode, into the existing PEF. Figure 3.1-1 illustrates the PEF site plus the PEF Expansion arrangement. Tables 3.4.1-1 and 3.4.1-2 list the major equipment and structures required for the PEF Expansion.

TABLE 3.4.1-1
PASTORIA ENERGY FACILITY 160 MW EXPANSION
MAJOR EQUIPMENT LIST

Description	Existing 750 MW Facility		Additional 160 MW Unit		Remarks
	Quantity	Size/Capacity	Quantity	Size/Capacity	
Configuration	One 2x1 configuration One 1x1 configuration		One 1x0 configuration		
Combustion Turbine Generators	3	160 MW	1	160 MW	Nominal output
Combustion Emissions Control	Dry Lo NO_X combustors		Dry Low- NO_X combustors		
Step-up Transformers	4 1	18/230 kV 13.8/230 kV	1	18/230 kV	
Circuit Breakers (Switchyard)	12	230 kV / 3000 A	1	230 kV / 3000 A	
CT Inlet Air Filter	3	3,600,000 lb/hr	1	3,600,000 lb/hr	
Inlet Air Cooling	Fogging		Fogging		
Post Combustion Emissions Control	3	SCR catalyst	1	SCR Catalyst	
Exhaust Stack	3		1	22'-9" diameter x 131' High	

TABLE 3.4.1-2
PASTORIA ENERGY FACILITY EXPANSION
MAJOR STRUCTURES AND EQUIPMENT

PEF Expansion	Description	Dimensions [1] Length (Feet)	Width (Feet)	Height (Feet)
1	Combustion Turbine Generator	100	40	20
1	CT Air Inlet Filter	70	30	45
1	GSU Transformer	20	20	20
1	Exhaust Stack		22.75 (diameter)	131

1 All structure dimensions shown are approximate. Structures greater than 50 foot high are identified to support air modeling considerations. Actual dimensions will be determined during detailed design.

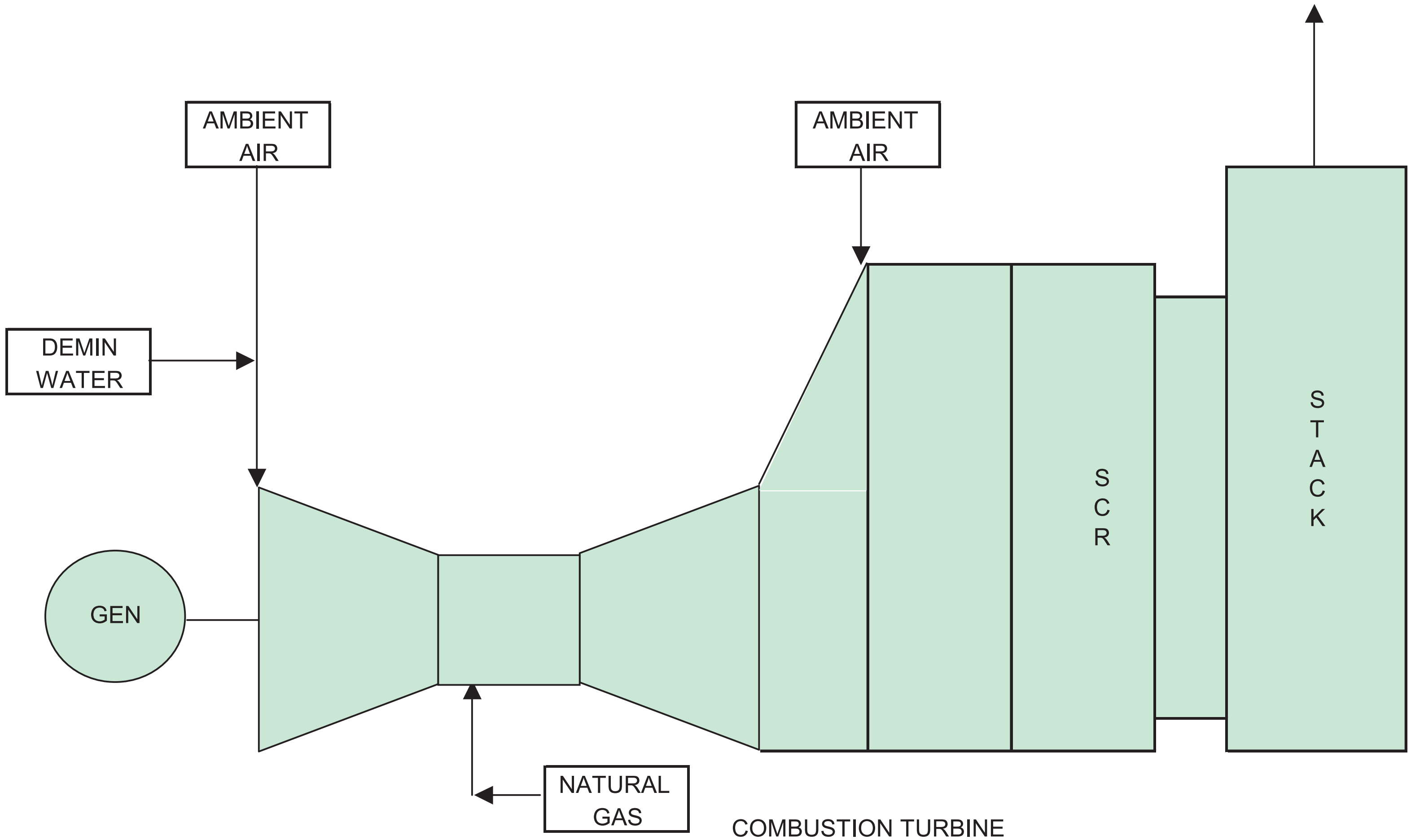
The PEF Expansion project will add a nominal 160 MW to the PEF described in 99-AFC-7, bringing the total combined nominal output to 910 MW. The unit is expected to have an overall availability of 95 percent or higher and could operate up to 8,760 hours per year.

The PEF Expansion will use Best Available Control Technology (BACT) to minimize gas turbine emissions. To achieve BACT, PEF Expansion proposes to install state-of-the-art, dry low NO_x (DLN) combustors in combination with selective catalytic reduction (SCR) to control NO_x. The height of the exhaust stack will be approximately 131 feet above finish grade.

This simple cycle CTG unit will produce a small fraction of the amount of air emissions produced by most existing gas fired steam power plants. A plant heat and mass balance is included as Figure 3.4-1. Sections 3.4.4.3, 3.4.4.5, and 5.2 of this application address plant emissions and emissions controls.

The PEF Expansion shares common auxiliary equipment and facilities with PEF as described in 99-AFC-7. Because the CTG and auxiliaries added by PEF Expansion are identical to existing PEF facilities, minimal additions are needed to tool and spare parts inventories. The PEF Expansion will not require an increase in the plant operational workforce.

No modifications to the existing PEF offsite linear facilities such as fuel gas and water supply pipelines or electric transmission lines are required.



Case:	Average Day		
Configuration:	1x0	Site Altitude:	1069 ft
Dry Bulb Temp.:	66 deg. F	Relative Humidity:	46%
Fog:	Yes		
Power Aug.:	No		
Duct Firing:	NA		

Performance		
Gross Ctg Output	164,100	KW
Auxiliary Loads	3,100	KW
Net Output	161,000	KW
Ctg Heat Input	1,736	MMBTU/H (HHV)
Net Heat Rate	10,785	BTU/KWH (HHV)

Pastoria Energy Facility Expansion

Source: CALPINE®

Figure 3.4-1. PEF EXPANSION HEAT AND MASS BALANCE DIAGRAM

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3.4.2 Site Access

Access to the PEF Expansion area will be from the existing PEF Plant Access Road as well as onsite PEF plant roadways. The approximately one-mile long Plant Access Road connects the existing PEF to the existing Edmonston Pumping Plant Road. The Plant Access Road crosses Tejon Ranch and California Department of Water Resources property and is described fully in 99-AFC-7.

3.4.3 Pastoria Energy Facility Site Layout

The PEF Expansion will be constructed on approximately two acres of the existing 31-acre PEF site on land leased from the Tejon Ranchcorp. The PEF Expansion general arrangement, illustrated on Figure 3.1-1, is designed to make use of the area reserved for this expansion as referenced and described in 99-AFC-7. Spacing between equipment is maintained as necessary for safety and for efficient access for operations and maintenance.

As described in 99-AFC-7, an area for a possible future fourth CTG was reserved. The equipment is arranged to provide operational and maintenance access and to promote economical construction. The CTG is located in the western portion of the site in a north-south orientation. The CTG exhaust duct continues north from the combustion turbine to the exhaust stack. The generator step up transformer is located south the CTG (Figure 3.1-1). The PEF Expansion will use the existing PEF switchyard located to the south.

The fuel gas scrubber and metering facilities for the existing PEF, located in the northeast area of the PEF site, are adequately sized to support the PEF Expansion.

The existing PEF plant control room, administration offices, personnel facilities, warehouse, and maintenance shop located in a building in the north-central area of the site, will support the PEF Expansion. The facility meeting and training room and maintenance office are also located in this building. Only minimal expansion of the existing PEF monitoring and control systems is expected in order to accommodate the PEF Expansion.

The existing PEF water treatment building, located in the northeastern portion of the site near the entrance, houses water treatment equipment and provides safe storage areas for water treatment chemicals. This building will support the PEF Expansion without significant modification.

The existing PEF zero liquid discharge wastewater treatment system (zero discharge system), located in the north-central portion of the site, contains the reverse osmosis (RO) evaporator, crystallizer, and associated equipment. This facility will support the PEF Expansion without significant modification.

The existing PEF water and wastewater treatment systems are designed with sufficient capacity to accommodate the PEF Expansion. These systems are adequate to meet the needs of the new unit due to the very low water and wastewater volumes required. The PEF Expansion requires no new water storage tanks.

The existing PEF site grading and storm water control system, as described in 99-AFC-7, is designed with sufficient capacity to accommodate the PEF Expansion.

3.4.4 Combustion Turbine Generator

The PEF Expansion will use one heavy-duty advanced F-class CTG, which is nominally rated at 160 MW. PEF Expansion will incorporate the latest proven combustion turbine technologies in order to maximize plant performance while meeting BACT requirements.

The simple cycle process is illustrated in Figure 3.4-1 (Heat and Mass Balance).

3.4.4.1 Dry Low NO_x Combustors

The CTG incorporates a state-of-the-art dry low NO_x (DLN) combustor and uses an SCR catalyst for post-combustion control.

DLN combustors minimize formation of NO_x and CO by achieving a flame with minimal temperature variations. This is achieved through thorough mixing of a lean fuel/air mixture. The DLN system for General Electric's F-class turbines typically controls NO_x emissions at or below 9.0 ppmvd at 15 percent O_2. The GE system typically controls CO emissions at or below 6.0 ppmvd at 15 percent O_2.

3.4.4.2 Post Combustion Emissions Controls

A selective catalytic reduction (SCR) system will be installed in the CTG exhaust stream. Anhydrous ammonia (NH_3) is introduced upstream of the SCR catalyst. The catalyst causes NH_3 to combine with NO_x, producing N_2 and H_2O. The SCR system reduces NO_x emissions to a maximum one-hour rolling average of 2.5 ppmvd at 15 percent O_2 while limiting ammonia slip to 10.0 ppmvd or less, at 15 percent O_2.

3.4.4.3 Emissions Dispersion

The exhaust gases exit the CTG through a vertical stack. The stack discharges the gases to the atmosphere at a temperature of approximately 800 °F and at a height of 131 feet above ground level. At this temperature and elevation the gases mix with ambient air and are dispersed.

3.4.4.4 Performance Data

Predicted performance data play a major role in the selection of turbine generators. Key elements of the performance data compilation are net power output, fuel input and net heat rate. Figure 3.4-1 is a heat and mass balance diagram that provides these data for a representative operating condition.

Gas turbine power output and efficiency are greatly affected by atmospheric conditions and load variations. Power output is roughly proportional to mass flow which increases as the inlet air becomes colder and more dense. Higher humidity makes the air less dense and also decreases the oxygen level per unit mass. Consequently, more fuel can be added and more power is produced at lower temperatures and humidities. Alternatively, less fuel can be added and less power is produced at higher temperatures and higher humidities. Turbine efficiency decreases as conditions depart from the optimum full-load design point.

3.4.4.5 Emissions Data

Air emissions are affected by turbine design and operating conditions. Emissions data for the PEF Expansion CTG unit are provided in Section 5.2 and the Air Quality Technical Report in this application.

3.4.5 Heat Rejection System

The PEF Expansion CTG auxiliary heat exchangers will use the PEF circulating water system for cooling. The existing PEF circulating water system is designed with sufficient capacity to accommodate the PEF Expansion.

3.4.6 Major Electrical Equipment

The two-on-one (2x1) plus one-on-one (1x1) single-line diagram for the existing PEF has been updated to include the one-on-zero (1x0) PEF Expansion unit, as shown in Figures 3.4-2 and 3.4-3. These figures illustrate the overall generation system for the facility. The CTG produces power at 18 kV. The generator output passes through a step-up transformer where the voltage is increased to a transmission level of 230 kV. The PEF Expansion will utilize the existing transmission line that connects PEF to the existing SCE grid at Pastoria Substation.

A portion of the plant output is converted to lower voltages to power station auxiliaries. Essential control systems are protected with an AC uninterruptible power supply (UPS). A 125 VDC system provides battery power for the AC UPS and for DC control systems.

3.4.6.1 Step-up Transformer

The PEF Expansion CTG is connected to a separate, two-winding, oil-filled, 18 kV to 230 kV step-up transformer. Connection to the step-up transformer is made through an isolated phase bus. The transformer is anchored on concrete foundations that also provide oil containment. The high side of the step-up transformer is terminated at the plant 230 kV switchyard. Surge arrestors are installed on the high voltage bushings of the transformer to protect the transformer from surges due to lightning strikes, switching or other disturbances on the 230 kV system. A concrete firewall separates each transformer from other transformers and critical equipment.

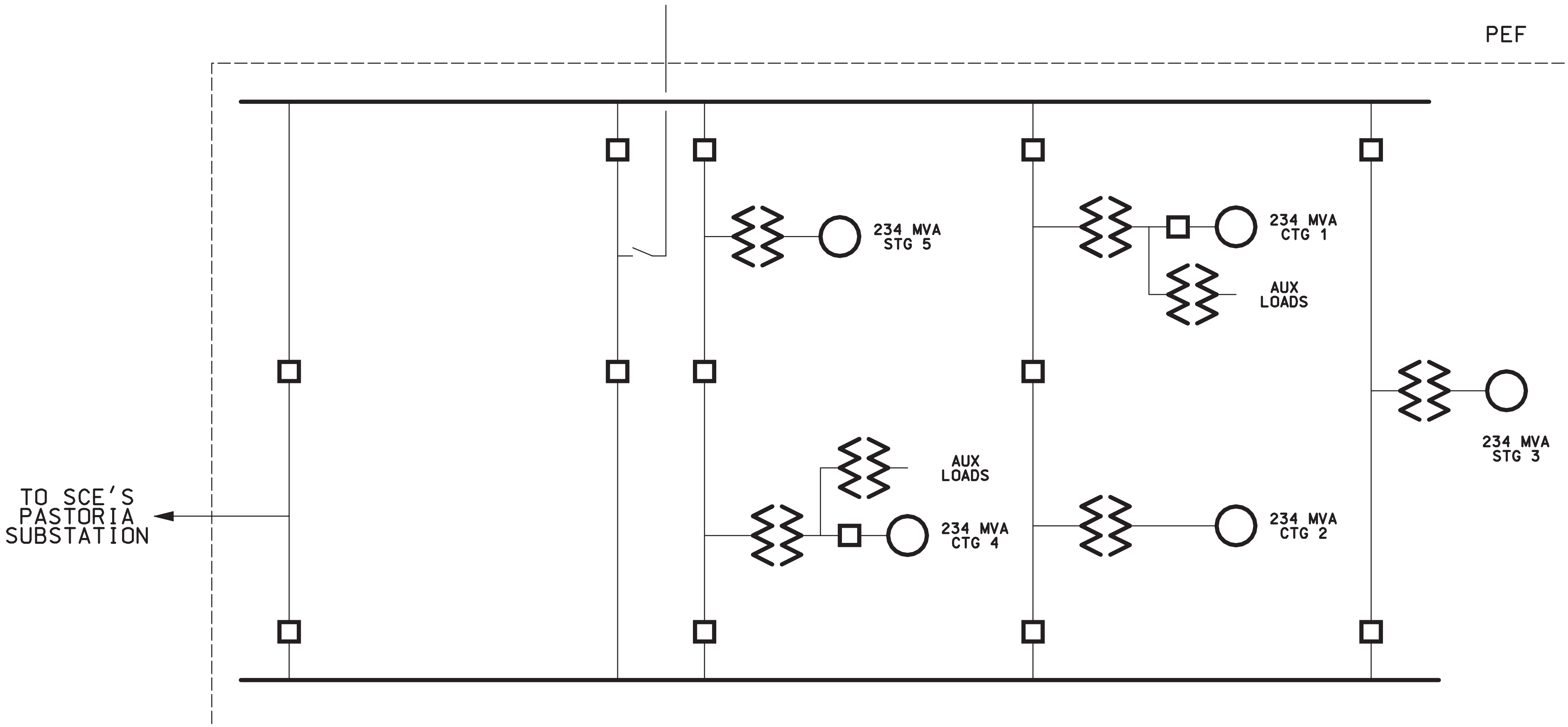
3.4.6.2 230 kV Switchyard

The step-up transformer is connected to the grid through the existing 230 kV switchyard at the SCE Pastoria Substation. The PEF Expansion adds one 230 kV SF6 circuit breaker to the existing switchyard using one bay. A motorized disconnect switch is at the end of the breaker.

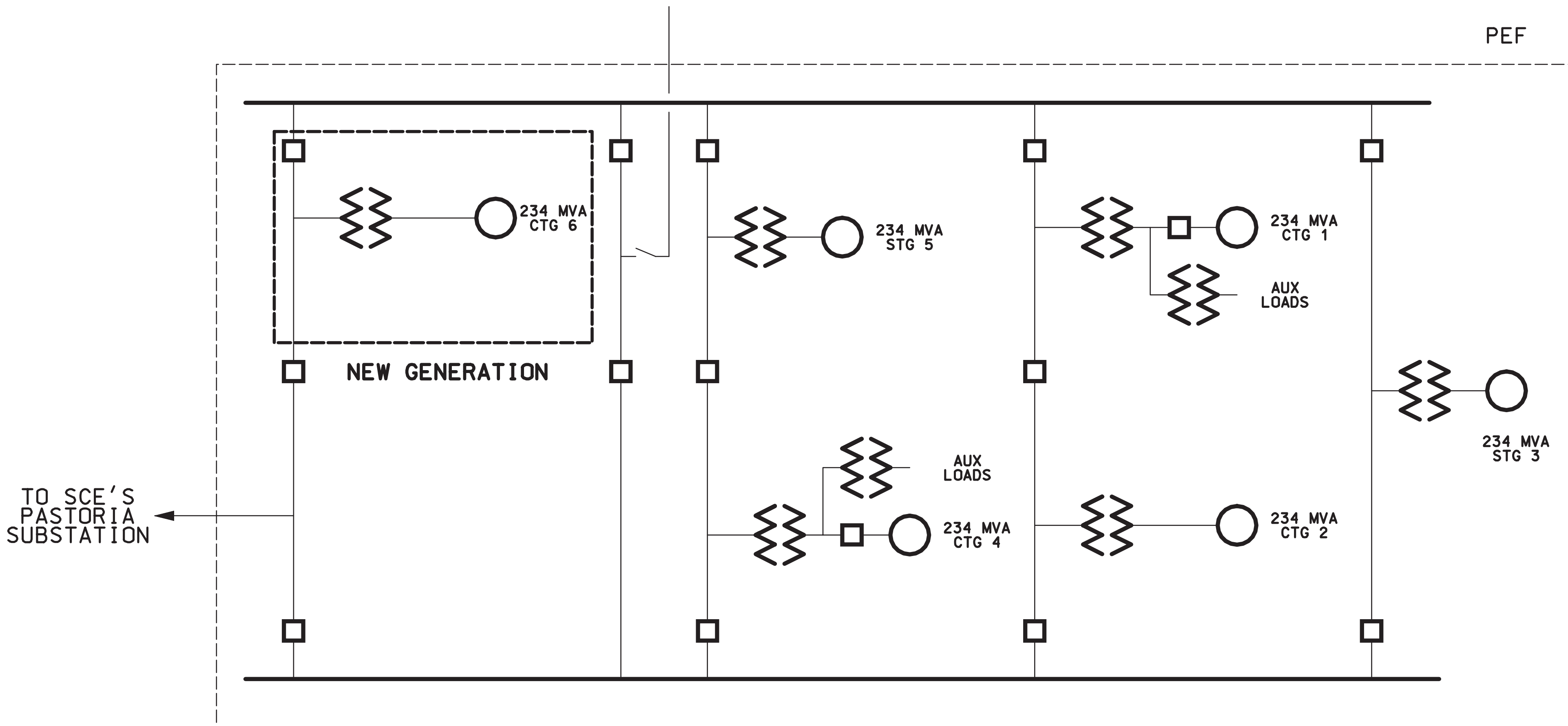
3.4.6.3 AC Power Distribution

Plant auxiliaries are powered at 4,160 V, 480 V, and 208/120 V. An existing 230 kV to 4,160 V auxiliary transformer is used to power the plant electrical distribution system for the new CTG and its auxiliaries.

A double-ended 4,160 V switchgear, off of each auxiliary transformer, in turn feeds two 4,160 V to 480 V transformers, the combustion turbine (CT) starting equipment, and a 4,160 V motor control center (MCC) for motors larger than 200 HP. Each CTG/HRSG train has dedicated double-ended 480 V switchgear. Low voltage (480 V) MCCs at each CTG/HRSG train feed CT, ST, generator and balance of plant 480 V motor loads, low voltage distribution, and the DC power system.



Pastoria Energy Facility Expansion	Source: CALPINE®	**Figure 3.4-2.** PEF EXISTING SINGLE LINE DIAGRAM	April 2005



Pastoria Energy Facility Expansion	Source: CALPINE®	**Figure 3.4-3.** PEF EXPANSION SINGLE LINE DIAGRAM	April 2005

The existing AC power distribution system is designed so that loss of one unit auxiliary transformer will not limit plant output capability. The existing 4,160 V switchgear has vacuum breakers for the main feeds and vacuum breakers or fused contactors for power distribution. The 4,160 V system is low resistance grounded to limit the maximum fault current to 400 Amps. The 480 V system is solidly grounded. Power for the 208/120 VAC system is provided by the low voltage MCCs through 480-208 V dry type transformers.

3.4.6.4 DC Power Supply

The new PEF Expansion CTG will have its own 125 V DC power supply consisting of one 125 V battery, one battery charger, and one 125 VDC panel board. The battery charger receives 480 V, three-phase power from one of the MCCs. It supplies power to the DC loads while continuously charging the battery. The 125 VDC system is ungrounded and includes a ground detector to detect ground faults.

The existing 125 VDC system in the 230 kV switchyard has sufficient capacity to feed the additional 230 kV breaker controls and the step-up transformer controls.

3.4.6.5 Uninterruptible Power Supply (UPS) System

DCS and other critical, 120 VAC, single-phase loads are supplied via an uninterruptible power supply (UPS) system. In a static solid state system, the UPS uses two DC/AC inverters, with maintenance bypass switches, and one 120 VAC distribution panel. The DC/AC inverters are supplied via a dedicated 125 VDC battery system.

3.4.7 Natural Gas Fuel Supply

The PEF Expansion combustion turbine will operate on a single-fuel, natural gas. Natural gas will be supplied from the existing 14.01-mile 20-inch PEF natural gas supply system. The natural gas supply pipeline is of sufficient capacity to serve the PEF Expansion with no further modification. The proposed pipeline route and construction are described in more detail in Section 3.7.1 of 99-AFC-7.

The "F Class" CTG requires approximately 450 psig fuel gas pressure. The existing Kern River/Mojave pipeline normally operates between 700 and 900 psig. It is expected to reliably supply the required inlet pressure without need of supplemental compression.

3.4.8 Water Supply and Treatment

3.4.8.1 Water Balance and Supply Requirements

The PEF Expansion will require up to approximately 55 acre-feet of additional water per year. Essential plant functions requiring water are evaporative cooling of the CTG inlet air, cooling of the CTG auxiliary heat exchangers, and utility water for washdown and other purposes.

The maximum makeup water flow rate to the existing PEF is limited by contract to 10.5 cubic feet per second (4,713 gpm). With the PEF Expansion included, the combined facilities (existing PEF and PEF Expansion) will operate at or below this limit when operating at full capacity. The peak water demand will occur during the months of June, July, August and September.

3.4.8.1.1 Water Balance. Plant water supply requirements and water balance calculations for the existing PEF and the PEF Expansion are tabulated in Table 3.4.8-1 of this application. This table provides both the expected maximum water usage rates as well as annual average usage rates. Water balance diagrams for the existing PEF and PEF Expansion are provided in Figures 3.4-4 and 3.4-5 of this application.

TABLE 3.4.8-1
PASTORIA ENERGY FACILITY EXPANSION
INCREMENTAL WATER USAGE RATES

	PEF Expansion 160 MW (Incremental)		Existing PEF 750 MW	
Water Use	Average Day (gpm)[1]	Maximum Summer Day (gpm)[2]	Average Day (gpm)[1]	Maximum Summer Day (gpm)[2]
EQUIPMENT MAKEUP WATER REQUIREMENTS				
Makeup water for cooling towers	16	16	2882	4598
Makeup water for CTG inlet fogging	17	49	51	147
Makeup water for potable and service water usage and miscellaneous losses	0	0	11	13
TOTAL WATER MAKEUP REQUIREMENTS	34	66	2945	4758
PLANT WASTEWATER DISCHARGE:				
Sludge cake and crystallizer cake	0	0	2	3
Sanitary wastewater discharge to leach system	0	0	1	1
TOTAL PLANT WASTEWATER DISCHARGE	0	0	3	4

1 "Average Day" is based on ambient conditions of 63.2º F db and 50.1º F wb with fogging on.

2 "Maximum Summer Day" is based on ambient conditions of 114º F db, 73º F wb with fogging on.

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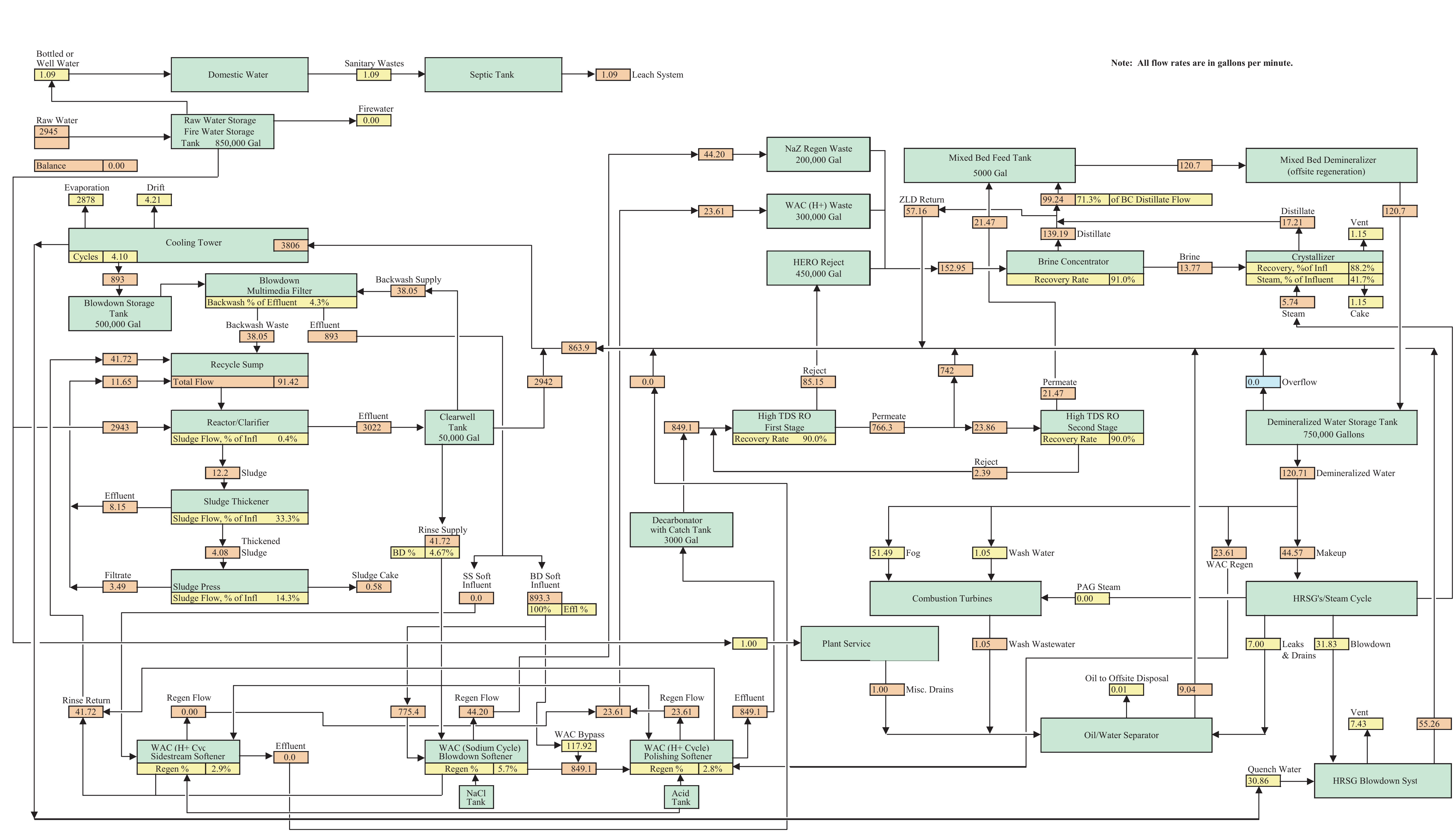


Design Case: Case GP (Avg Day)

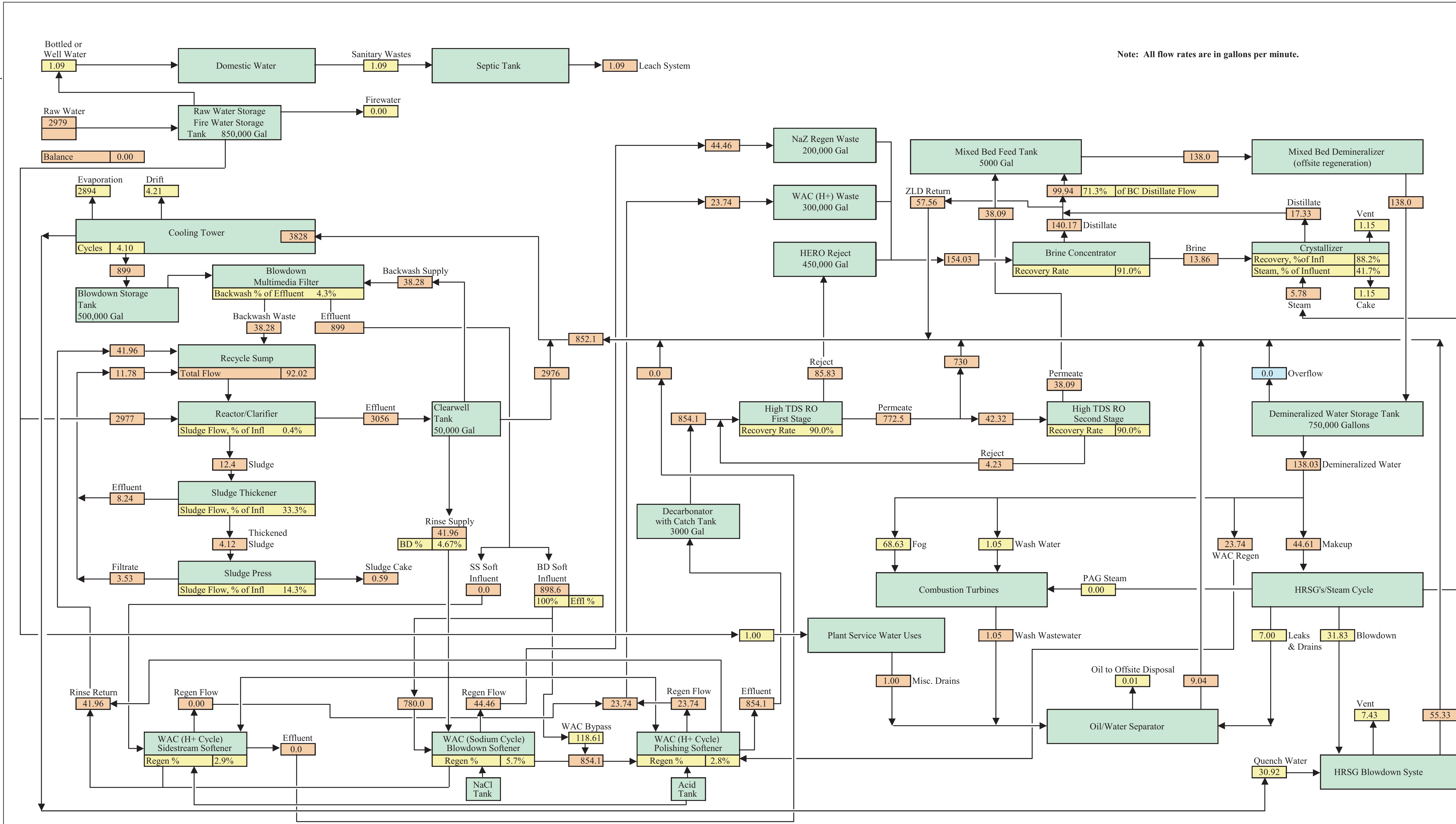
Configuration:	2x1, 1x1	Pressure:	14.17 psia
Dry Bulb Temp.:	63.20 deg F	Wet Bulb Temp.:	50.10 deg.F
Fog:	Yes		
Power Aug.:	No		
Duct Firing:	No		

Pastoria Energy Facility Expansion

Source: CALPINE®

Figure 3.4-4. EXISTING PEF WATER BALANCE

April 2005



Design Case: Case GP (Avg Day)

Configuration:	2x1, 1x1, 1x0	Pressure:	14.17 psia
Dry Bulb Temp.:	63.20 deg F	Wet Bulb Temp.:	50.10 deg.F
Fog:	Yes		
Power Aug.:	No		
Duct Firing:	No		

Pastoria Energy Facility Expansion	Source: CALPINE®	**Figure 3.4-5.** PEF EXPANSION WATER BALANCE	April 2005

3.4.8.1.2 <u>Water Supply Sources</u>. The PEF Expansion will receive water under the existing PEF long-term contract with WRMWSD. The existing PEF project and PEF Expansion will be supplied from an existing WRMWSD line identified as 14-G. The length of the connection is approximately 500 feet and is shown on Figure 3.1-4.

No new water storage facilities are required to meet the water requirements of the new CTG unit due to the very minimal water requirements and the adequate capacity of the existing storage needs.

3.4.8.2 Water Treatment

Table 3.4.8-2 and Table 3.4.8-3 (these tables are the same tables used for 99-AFC-7) of 99-AFC-7 provide a representative analysis of the raw water supply from the California Aqueduct and the White Wolf Water Bank. These analyses will vary seasonally and with changes in usage patterns in the area.

The water treatment requirements for the 160 MW simple cycle CTG unit inlet air cooling system are to supply a fogging system with demineralized water. The demineralized water will be supplied from the existing demineralized water storage tank.

3.4.8.3 Water Treatment Systems

PEF Expansion will use the existing PEF water treatment systems with no significant modification. The existing PEF water treatment systems are as they were described in 99-AFC-7.

Due to the very minimal water requirements of the PEF Expansion, no significant changes are expected for the existing PEF water treatment chemical usage or storage.

3.4.8.4 Wastewater Treatment and Discharge

The PEF Expansion will have a negligible impact on the existing PEF wastewater treatment and discharge systems. The PEF Expansion will use the existing PEF wastewater treatment and discharge systems with no significant modification.

A wastewater management system ensures that wastewater produced by PEF Expansion is properly collected, treated if necessary, and discharged from the facility. Solid wastes are also generated in several parts of these systems.

TABLE 3.4.8-2
PASTORIA ENERGY FACILITY EXPANSION
CALIFORNIA AQUEDUCT WATER ANALYSIS

Components	Units	Jul-98	Aug-98	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Mean
Alkalinity	mg/l	41	66	65	61	63	66	102	109	51	69	79	80	71
Arsenic	mg/l	0.002	0.003	0.003	0.002	0.002	0.002	0.003	0.003	0.001	0.002	0.002	0.002	0.002
Boron	mg/l	0.104	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bromide	mg/l	0.07	0.19	0.11	0.06	0.06	0.08	0.17	0.13	0.13	0.15	0.17	0.18	0.13
Calcium	mg/l	12	19	17	15	14	16	26	27	15	19	18	20	18
Carbon- Total Organic	mg/l	4.4	3.4	3	3	2.5	2.5	9	3	3.4	3.2	3.2	3.3	3.7
Chloride	mg/l	22	57	37	21	20	25	48	42	26	49	58	62	39
Chromium	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	0.005	0.007	<0.005
Copper	mg/l	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Fluoride	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hardness	mg/l	52	93	80	66	64	69	114	121	66	89	90	99	84
Iron	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Lead	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/l	5	11	9	7	7	7	12	13	7	10	11	12	9
Manganese	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate +Nitrite	mg/l	NR	0.65	0.5	0.64	0.66	0.79	0.54	0.36	0.76	0.76	0.44	0.48	0.55
Phosphorus-Ortho	mg/l	0.08	0.11	0.1	0.07	0.07	0.06	<0.01	<0.01	0.07	0.05	0.07	0.08	0.06
Phosphorus- Total	mg/l	0.2	0.2	0.13	0.12	0.1	0.08	0.07	0.04	0.23	0.08	0.15	0.1	0.13
Selenium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	19	41	30	21	20	26	43	41	26	45	45	52	34
Specific Conductance	μS/cm	205	398	313	239	235	272	426	433	277	416	414	436	339
Sulfate	mg/l	20	34	27	22	21	22	44	47	36	55	24	38	33
Total Dissolved Solids	mg/l	114	219	198	139	137	152	234	223	143	230	249	230	189

TABLE 3.4.8-2 (CONTINUED)
PASTORIA ENERGY FACILITY EXPANSION
CALIFORNIA AQUEDUCT WATER ANALYSIS

Components	Units	Jul-98	Aug-98	Sep-98	Oct-98	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99	Jun-99	Mean
Trihalomethane Formation Potential	μg/l	485	412	420	357	322	324	386	335	380	394	345	303	372
Turbidity	NTU	140	70	48	15	6.8	3.7	4	3	47	16	30	24	34
Zinc	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
pH														
Temperature														
TSS														

mg/l = milligrams per liter
μg/l = micrograms per liter
μS/cm = microSiemens per centimeter
NTU = nephelometric turbidity unit
NR = Not Reported
Note: Samples taken by CDWR at Tehachapi Afterbay (Check 41) on the California Aqueduct

TABLE 3.4.8-3
PASTORIA ENERGY FACILITY EXPANSION
WATER QUALITY ANALYSIS, WHITE WOLF WATER BANK
WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT[1]

Constituent	Units(2)(3)	Quality
Electrical Conductivity	mμms/cm	635
Nitrate	mg/L	18
Sodium	mg/L	38
Chloride	mg/L	36
Boron	mg/L	0.3
Dominant		
cation		Calcium
anion		Bicarbonate

1 Data from Wheeler Ridge-Maricopa Study; samples taken in 1991.
2 Unit = umhos = microsiemens per centimeter.
3 Unit = mg/L = milligrams per liter.

Table 3.4.8-1 of this application compares the incremental plant water consumption and wastewater rates due to the PEF Expansion to the PEF existing consumption rates. Figure 3.4-5 (Water Balance Diagram) of this application illustrates these streams. Figure 3.4-4 shows the existing PEF water balance diagram for reference purposes.

The existing plant's process wastewater will consist primarily of clearwell water from the oil-water separator and will not significantly change due to the PEF Expansion.

3.4.8.4.1 Plant Drains and Washdown. A facility-wide system is designed to collect wastewater from equipment washdown and leakage, sample drains, and miscellaneous plant drains. Water from areas that may accumulate miscible chemicals will be collected in a system of floor drains, sumps, and piping and routed through the existing PEF oil-water separator and ultimately to the existing PEF zero discharge system.

3.4.8.4.2 Domestic/Sanitary Wastewater. The PEF Expansion will not require any changes to the existing PEF domestic/sanitary waste systems. These systems are described in Section 3.4.8.5.3 of 99-AFC-7 (included in Attachment A of this application).

3.4.8.4.3 Stormwater Drainage. Rainfall from the project site will be predominantly drained by sheet flow and will maintain the integrity of the existing drainage patterns wherever possible. Based on the final site-grading plan, some isolated areas may require underground stormwater collection and drainage piping. Stormwater will be collected on-site using above ground and underground drainage and collection systems. Stormwater will be discharged to the PEF on-site Storm Water Quality Control Pond.

Oil leakage from equipment is expected to be minimal. Composition will be similar to standard parking lot impacts. Nonetheless, all equipment that has potential for significant leakage of oil or hazardous chemicals, such as glycol coolants, will be located within spill containment basins.

Stormwater from basins which could collect only non-miscible oil will be directed to the existing PEF oil-water separator which consists of a basin with a clearwell and oil absorbent pillows.

Basins that collect miscible chemicals or volatile liquids will be directed to another separator, as described in Section 3.4.8.4.1 Plant Drains and Washdown.

3.4.9 Waste Management

The PEF Expansion will generate a variety of non-hazardous and hazardous wastes during construction and operation (see Tables 3.4.9-1 and 3.4.9-2). These include liquids and solids from the wastewater system (discussed in Section 3.4.8.5.1) waste filters, replaceable parts, rags, and other waste materials and chemicals produced from maintenance activities, equipment fluids and skimmed oil.

Handling of hazardous wastes is discussed in Section 3.4.10 and Section 5.15 of this application.

3.4.9.1 <u>Solid Wastes – Non-Hazardous</u>

3.4.9.1.1 <u>Construction Wastes</u>. Inert solid wastes resulting from construction activities may include lumber, excess concrete, metal and scrap, and empty non-hazardous containers. Management of these wastes will be the responsibility of the construction contractor(s). Typical management practices required for contractor waste include recycling when possible, proper storage of waste and debris to prevent wind dispersion, and weekly pickup of wastes with disposal at local Class III landfills. The total amount of solid waste generated by construction activities has been estimated to be similar to that for normal commercial construction. It is not expected to result in a significant impact on public health or to cause adverse effects on local landfill capacity. Table 3.4.9-1 (Summary of Construction Waste Streams and Management Methods) provides an overview of the waste streams anticipated for the construction phase of the project.

TABLE 3.4.9-1
SUMMARY OF CONSTRUCTION WASTE STREAMS AND MANAGEMENT

Waste Stream and Classification	Origin and Composition	Estimated Amount Existing PEF 99-AFC-7	Estimated Amount PEF Expansion	Estimated Frequency of Generation	On-site Treatment	Waste Management Method
Construction Waste – Nonhazardous	Scrap wood, steel, glass plastic, paper	40 cu yd/wk	10 cu yd/wk	Intermittent	None	Dispose to landfill
Construction Waste – Hazardous	Empty hazardous material containers	1 cu yd/wk	<1 cu yd/wk	Intermittent	Store for < 90 days	Dispose to hazardous waste disposal facility
Construction Waste – Hazardous	Solvents, used oils, paint, oily rags, adhesives	165 gallons	40 gallons	Every 90 days	Store for < 90 days	Dispose to hazardous waste disposal facility or recycle
HRSG and preboiler piping cleaning waste – Hazardous	Chelant type solution	100,000 gallons	0 gallons	One time event	None	Dispose to hazardous waste disposal facility or recycle
Spent batteries- Hazardous	Lead acid, alkaline type	20 in 2 years	5 in 2 years	Intermittent	Store for < 90 days	Dispose to recycling facility
Stormwater from Construction area – Nonhazardous	Surface runoff (Water, inert material, dirt and concrete particles)	1500 gpd	No increase	Intermittent	None	Discharge to the Existing evaporation pond
Residual solids from Evaporation pond – Nonhazardous	Dirt and concrete Particles	50 cu yd	No increase	One time at end of construction	None	Excavate at end of construction and spread on site
Sanitary waste – Nonhazardous	Portable Chemical Toilets Sanitary waste	200 gpd	50 gpd	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary water Treatment plant

TABLE 3.4.9-2
PASTORIA ENERGY FACILITY EXPANSION
SUMMARY OF OPERATIONS WASTE STREAMS AND MANAGEMENT METHODS

Waste Stream	Classification and Status	Origin and Composition	Estimated Amount		Estimated Frequency of Generation	Waste Management Method	
			Existing PEF 750MW	PEF Expansion 910MW		Onsite	Offsite
Used Hydraulic Fluid, Oils and Grease, and Oily Filters	Hazardous Recyclable	CTG, STG and other users of hydraulic actuators and lubricants	< 5 gpd	< 1 gpd	Intermittent	Store for < 90 days	Recycle
Used Air Filters	Nonhazardous	CTG	2000 Filters	700 Filters	Every 5 Years	None	Recycle
Spent batteries	Hazardous Recyclable	Lead Acid, Alkaline	5 per year 400/year	1 per year 100/yr	Intermittent	Store for< 90 days	Recycle
Spent SCR Catalyst	Hazardous Recyclable	HRSG/Exhaust Duct, Heavy metals	16,000 cu ft	5,300 cu ft	Intermittent Once every 3 to 5 years	None	Recycle
Oily Rags	Nonhazardous	CTG, STG and other users of hydraulic actuators and lubricants	Approximately 800 rags per year	Approximately 180 rags per year	Intermittent	Store for < 90 days	Laundry at authorized facility
Oily Absorbent	Hazardous Recyclable	CTG, STG and other users of hydraulic actuators and lubricants	Approximately 200 pounds per year	Approximately 40 pounds per year	Intermittent	Store for < 90 days	Dispose to authorized waste disposal facility
Sanitary Wastewater	Nonhazardous	Rest Rooms, Waste Rooms, Sanitary Waste	1400 gpd	No increase	Continuous	Liquids disposed to on-site leaching field	Sludge disposed to sanitary waste disposal facility
Salt Cake Zero Discharge	Non-hazardous or Designated Waste	Naturally occurring salt compounds	2 to 4 cu yds/day	No increase	Continuous	None	Commercial sale or dispose to nonhazardous waste disposal facility or Class II waste treatment site

3.4.9.1.2 <u>Operations Wastes</u>. Inert solid wastes generated at the facility during operation are predominantly office wastes and routine maintenance wastes such as scrap metal, wood and plastic from surplus and deactivated equipment and parts. Scrap materials such as paper, packing materials, glass, metal, and plastic will be segregated and managed for recycling. Non-recyclable inert wastes will be stored in covered trash bins in accordance with local ordinances and picked-up by an authorized local trash hauler on a regular basis for transport and disposal in a suitable landfill in the area. Table 3.4.9-2 (Summary of Operations Waste Streams and Management Methods) provides an overview of the waste streams anticipated for the construction phase of the project.

3.4.9.2 <u>Liquid Wastes – Non-Hazardous</u>

Non-hazardous liquid wastes produced in the facility consist of wastewater system wastes and are not expected to significantly change with the PEF Expansion. Handling and disposal of these wastes is discussed in Section 5.15 of this application. Skim oil collected from equipment drains and other liquids drained from equipment will generally be treated as hazardous due to possible heavy metals content.

3.4.10 Management and Disposal of Hazardous Material and Hazardous Waste

The PEF Expansion will implement the Hazardous Materials Management Program (HMMP) developed for the existing PEF that includes procedures for:

- Hazardous materials handling, use and storage
- Emergency response
- Spill control and prevention
- Employee training
- Reporting and record keeping

3.4.10.1 <u>Chemical Management</u>

Tables 3.4.10-1 (Summary of Water Treatment Chemical Usage) and 3.4.10-2 (Summary of Non-Water Treatment Chemical Usage) list the chemicals to be used, handled, or stored at the project site during operation. Sulfuric acid is listed in 40 CFR 355 as an extremely hazardous substance and requires special handling (see Sections 5.15, Hazardous Materials Handling and 5.16, Public Health).

TABLE 3.4.10-1
PASTORIA ENERGY FACILITY EXPANSION
SUMMARY OF WATER TREATMENT CHEMICAL USAGE AND STORAGE

Chemical	Application	Expected Storage Quantity (Average Gallons)	
		Existing PEF 750 MW	PEF Expansion
Sulfuric acid 93%[1] (H_2SO_4)	pH control of cooling towers neutralize excess alkalinity	3500	No Change
Sodium hydroxide[2] 32% (NaOH)	pH control of cooling towers	3500	No Change
Oxygen scavenger 30% concentration	Boiler chemical	100	No Change
Neutralizing amine 20% concentration	Boiler chemical	150	No Change
Phosphate 20% concentration	Removal of dissolved hardness ions (scale deposit control)	100	No Change
Sodium hypochlorite 12.5% solution (Bleach)	Biocide for cooling water	1500	No Change
Bromine Biocide and Biodispersant	Fed with Bleach	1500	No Change
Dehalogenation agent – Nalco1316 or equal	Neutralize oxidant from chlorine & Bromine	1500	No Change
Disodium phosphate	Boiler pH and scale control	750 lbs	No Change
Trisodium phosphate	Boiler pH and scale control	750 lbs	No Change
Scale inhibitors	Scale reduction in cooling water	200	No Change
Polymer	Water treatment coagulant	800	No Change
Aluminum sulfate	Water treatment coagulant	500	No Change

1 California Toxic chemical.

2 California air toxic "hot spots" chemical.

TABLE 3.4.10-2
PASTORIA ENERGY FACILITY EXPANSION
SUMMARY OF NON-WATER TREATMENT CHEMICAL USAGE AND STORAGE

Chemical	Application	Storage Location	Storage or Usage Quantity: Average: PEF 750 MW	Storage or Usage Quantity: Average: *PEF + PEF Expansion 910 MW*	Storage or Usage Quantity: Maximum: PEF 750 MW	Storage or Usage Quantity: Maximum: *PEF + PEF Expansion 910 MW*
Natural gas	Fuel for power plant	Piped into plant on as-needed basis	NA	*NA*	NA	*NA*
Anhydrous Ammonia [1]	SCR –NOx control system	NE area of site	30,000 Gallons	*30,000 Gallons*	60,000 Gallons	*60,000 Gallons*
Insulating oil (heat transfer)	Electric equipment	--	60,000 gal Initial fill	*83,000 gal Initial fill*	*Not stored on-site. Initial fill quantity is brought to site at the time of replacement*	
Lubricating oil	Rotating equipment	Throughout plant	7000 gal Initial fill	*9000 gal Initial fill*	*350 Gallons*	
Carbon dioxide	Fire protection, generator purging	--	12,000 lbs Initial fill	*15,000 lbs Initial fill*	NA	*NA*
Hydrogen	Generator cooling	Near HRSG 4	11,200 cubic feet Initial fill	*14,000 cubic feet Initial fill*	*10,000 cubic feet bulk storage*	
Hydrochloric acid	HRSG cleaning	--	Prior to startup 10,000 lbs	*Not required*	Not required	*Not required*
Ammonium bifluoride	HRSG Cleaning	--	Prior to startup 200 lbs	*Not required*	Not required	*Not required*
Various Detergents	Combustion turbine cleaning	--	Prior to startup 1300 lbs	*Prior to startup 500 lbs*	Periodic short term storage 500 lbs	
Diesel Fuel	Firewater Pump	Firewater Skid	100 gal Initial fill	*100 gal Initial fill*	Maintain full diesel tank	

1 California extremely hazardous material. Material would be transported to the site using 8,000-gallon tanker trucks.

The storage, use, and handling of these hazardous materials will be in accordance with applicable laws, ordinances, regulations, and standards and will include the following components:

- Updates to the HMMP for the existing PEF.
- Facility personnel are trained in hazardous materials and hazardous waste awareness, handling and management as required for their level of responsibility.
- Bulk chemicals are stored in aboveground storage tanks while all other chemicals are stored in the original shipping container.
- Chemical storage areas and feed/transfer areas are equipped with secondary containment sufficient in size to contain the volume of the largest storage container or tank including an allowance for rainwater.
- Small quantity chemicals used for maintenance tasks are kept in appropriate flammable material or corrosive material storage lockers.
- Periodic inspections will ensure that all containers are secure and properly marked.

3.4.10.2 Hazardous Wastes

Table 3.4.9-1 Summary of Operation Waste Streams and Management lists the types of wastes to be generated during operation of the project. These wastes will be managed in accordance with applicable laws, ordinances, regulations, and standards consistent with the implementation of the HMMP for the existing PEF.

3.4.11 Emissions Control and Monitoring Equipment

BACT will be incorporated in the design of emissions control and monitoring facilities for PEF Expansion. Continuous emission monitoring system (CEMS) equipment will record NO_x and CO emissions and alert operators of deviations from design levels. The following subsections describe the emissions controls. Emissions data, emissions impacts, and applicable regulations are addressed in Section 5.2 and the Air Quality Technical Report of this application.

3.4.11.1 NO_x Production and Control Mechanisms

The PEF Expansion will use Best Available Control Technology (BACT) to minimize combustion turbine emissions. To achieve BACT, PEF Expansion proposes to install state-of-the-art, dry low NO_x (DLN) combustors in combination with selective catalytic reduction (SCR) to control NO_x. The design of the emissions control system(s) for PEF Expansion will reduce NO_x emissions to 2.5 ppmvd or less at 15 percent O_2 at the stack as measured on a one-hour rolling average. The air modeling analysis for this project is based on stack NO_x emission rates of 2.5 ppmvd at 15 percent O_2.

3.4.11.2 NO_x Formation

NO_x is produced when oxygen and nitrogen come together under high temperature. In the typical combustion process, temperature distribution is erratic. NO_x production is greatest where the highest temperatures exist.

3.4.11.3 Dry Low NO_x Combustors

DLN combustors combined with post emission control will be used. DLN combustors reduce NO_x by thoroughly mixing air and fuel to create an even temperature spread, thereby reducing temperature peaks. For a given heat input, the peak temperature, and therefore peak NO_x production, is lower. For a given NO_x level, a gas turbine using DLN technology can operate at a higher temperature where its thermodynamic efficiency is higher.

The exhaust gases of F-Class CTGs using DLN technology contain between 9.0 and 25.0 ppmvd NO_x at 15 percent O_2 when operating at full load. As the CTG operating load decreases, the ability of the DLN combustors to control NO_x production also decreases. To maintain control of stack NO_x emissions, the CTGs will not be operated below the effective DLN control level which is approximately 50 percent load with General Electric Frame 7FA.

3.4.11.4 SCR System

The SCR system consists of the reduction catalyst and an anhydrous ammonia injection system. The catalyst and ammonia injection grid is arranged so that ammonia vapor, injected into the CTG exhaust gas stream, will be well mixed with the exhaust gas when it reaches the catalyst. As this gas stream passes over the catalyst bed, the ammonia (NH_3) combines with NO_x, in a reduction reaction, to produce nitrogen gas (N_2) and water vapor (H_2O). A small amount of ammonia slip results from the SCR operation.

The two existing anhydrous ammonia storage tanks have sufficient capacity to accommodate the PEF Expansion. The injection system and transfer piping will be provided with control and monitoring equipment as needed to ensure safe and effective operation of the system.

3.4.11.5 CO and VOC Emissions

CO forms when hydrocarbons are burned in an oxygen deficient or low temperature atmosphere. The DLN technology in the CTG combustors will ensure that carbon monoxide (CO) emissions are minimized and comply with BACT levels.

VOCs include all unburned hydrocarbons except methane and ethane. They remain in the exhaust when part of the incoming fuel does not have sufficient contact with oxygen to support full combustion. For the PEF Expansion, VOC emissions are low and comply with BACT levels due to proper CTG combustion controls (DLN technology) and the use of natural gas as the single fuel.

3.4.11.6 Particulates

Particulate emissions are minimized through selection of natural gas as the exclusive fuel. Combustion of natural gas produces minimal particulate emissions compared to other fuels.

A significant fraction of the particulate matter in stack emissions consists of compounds of ammonium and sulfate. Sulfur compounds, contained in small quantities in natural gas, are oxidized in the gas turbine combustors to form CO_2, H_2O, SO_2, and SO_3. While most of the fuel sulfur is converted to SO_2, approximately 1.5 percent is converted to SO_3, which then combines with water in the exhaust to form H_2SO_4, which is defined as a condensable particulate. Passing through the SCR, some of the ammonia injected for NO_x control combines with H_2SO_4 to form ammonium sulfate and ammonia bisulfate, which form very fine solids which meet the air quality definition of noncondensable PM_{10}. The remaining SO_2 is emitted as a gas.

Inlet air filtration removes particulate matter present in the air, thus preventing it from entering and being exhausted by the turbine.

3.4.11.7 Emission Monitoring

A CEMS will be installed at the stack of the CTG. The system will sample, analyze and record the concentrations of carbon monoxide, oxides of nitrogen, oxygen and carbon dioxide in the flue gas. The system provides a record of emissions data and transmits alarm signals to the control room when the emissions level exceeds pre-selected limits. The CEMS will comply with 40 CFR 60 and 40 CFR 75 requirements.

3.4.12 Fire Protection and Safety Systems

The existing PEF fire protection and safety systems are designed to limit personnel injury, property loss, and plant downtime caused by a fire or other event. The systems are designed in accordance with:

- Federal, State and Local fire codes, occupational health and safety regulations, and other jurisdictional requirements
- California Building Code (CBC)
- National Fire Protection Association (NFPA) standard practices

Table 3.4.12-1 provides a summary of PEF Expansion fire protection systems design conditions. The subsections below provide a detailed description of the fire protection and safety systems for the PEF Expansion. The PEF Expansion will be fully integrated into the existing PEF fire protection and safety systems.

3.4.12.1 Firewater System

The PEF Expansion will be fully integrated into the existing PEF firewater supply and pumping system. The firewater system will be capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

3.4.12.2 Fixed Fire Protection Systems

A fixed fire protection system will be provided for the PEF Expansion step-up transformer.

3.4.12.3 Fire Alarm and Detection

The main fire control panel, located in the existing PEF Control Room, annunciates activation of a fire protection/detection system by location zones, and will include the PEF Expansion area. The panel operates on 120 VAC power through the UPS system. The alarm and detection system is designed to comply with NFPA 70 and 72.

Local building fire pull boxes and audible alarms will be provided. Flashing lights will be used in addition to audible alarms in high noise areas.

TABLE 3.4.12-1
PASTORIA ENERGY FACILITY EXPANSION
FIRE PROTECTION SYSTEMS DESIGN CONDITIONS [1]

Location	Type of System
Buildings	Automatic Clean Agent System per NFPA 2001 for Control Room, wet/dry/pre-action sprinkler system for Administrative areas, Warehouse, and offices. Firewater supply shall be from AVEK. NOTE: The fixed fire systems in the buildings will be provided as required by local jurisdiction or Uniform Building Code (UBC). Hose stations and portable extinguishers shall be provided throughout buildings as required by Code. Detection system and fire alarm pull stations shall be provided for the Control Room, combustion turbine inlet filter area and the switchgear room. Pull stations shall be located in buildings as required by Code.
Combustion Turbine	A Carbon Dioxide (CO_2) System or Clean Agent System as defined per NFPA 2001 will be provided for the combustion turbines.
Water Treatment Area	An automatic wet pipe sprinkler system (Refer to note in Building Section), portable “BC” rated fire extinguishers in all areas and hose reel stations with 100-foot hose in the area.
Outside Areas	Dry barrel type fire hydrants shall be designed, installed and located as per NFPA 24 and as required per local jurisdiction. The location of hydrants is not more than 300 feet apart in all outside areas as required by Code.

1 Systems are consistent with the existing PEF (99-AFC-7).

3.4.12.4 Portable Extinguishers

Portable CO_2 and dry chemical extinguishers will be located throughout the PEF Expansion area, with size, rating, and spacing in accordance with NFPA 10. Handcart CO_2 extinguishers will be provided as needed for specific hazards.

3.4.12.5 Miscellaneous Fire Safety Items

All materials of construction used in the plant will be free of asbestos and will meet the required fire and smoke rating.

Plant management will coordinate with the Kern County fire marshal and fire department to provide an appropriate orientation to the PEF Expansion and its operating and emergency procedures for emergency personnel.

3.4.12.6 Safety Fixtures

Existing PEF safety fixtures will be reviewed and enhanced if required to support the PEF Expansion project. These fixtures are fully described in Section 3.0 of 99-AFC-7 included in Attachment A, Project Description Materials, appended to this application.

3.4.13 Plant Auxiliaries

3.4.13.1 Lighting

Lighting will be required for safe and efficient operation in a number of areas. These include:

- Outdoor equipment platforms and walkways
- Transformer areas

To avoid intrusion on sensitive areas, outdoor lighting will be directed downwards and towards the interior of the plant.

Emergency lighting from DC battery packs will be provided in areas of normal personnel traffic to permit safe egress from the area in case of failure of the normal lighting system. In major control equipment areas and electrical distribution equipment areas, emergency lighting will be sufficient to allow equipment operation and to facilitate reestablishment of auxiliary power.

The Federal Aviation Administration (FAA) completed an aeronautical study for the 213 feet PEF HRSG Stacks. The study determined that the stacks should be marked and/or lighted in accordance with FAA Advisory Circular 70/7460-1K. Subsequent to the CEC approval of the license amendment to lower the HRSG stacks to 150 feet, a second FAA study was completed. FAA Advisory Circular 70/7460-1K requires that all airspace obstructions over 200 feet in height or in close proximity to an airfield have obstruction lighting. Since the existing stacks are 150 feet and there is no airfield in close proximity to the site, the 131 feet proposed PEF Expansion stack would not require obstruction lighting.

3.4.13.2 Grounding

The electrical system may experience unit ground potential rise due to ground fault, lightning strike, or switching surge. This constitutes a hazard to site personnel and electrical equipment. The PEF Expansion electrical system will be integrated with the existing PEF grounding system to permit dissipation of ground fault currents and minimize ground potential rise. The system is fully described in Section 3.0 of 99-AFC-7 (Section 3.4.13.2) included in Attachment A, Project Description Materials, and appended to this application.

3.4.13.3 Cathodic Protection and Lightning Protection

Cathodic protection may be provided, using an impressed current or buried anode system to prevent corrosion of buried carbon steel piping and structures. Protective coatings are applied as primary protection and to minimize cathodic protection current requirements. The requirement for a cathodic protection system will be determined during detailed design.

Lightning protection will be furnished for buildings and structures. Lightning protection for the switchyard will be installed in accordance with industry practice.

3.4.13.4 Distributed Control System

The PEF Expansion will be integrated into the existing PEF distributed control system (DCS) to provide coordinated monitoring and control for the PEF Expansion equipment. Plant operation is controlled from the control console in the existing PEF control room. A more detailed description of the DCS is provided in Section 3.0 of 99-AFC.7 (Section 3.9.2.6) included in Attachment A of this application.

3.4.13.5 Plant Service and Instrument Air System

The PEF Expansion service and instrument air system will be integrated with the existing PEF plant service and instrument air system.

3.4.14 Plumbing

The existing PEF plant plumbing systems constructed in accordance with the Uniform Plumbing Code and local and state regulations will be adequate to support the PEF Expansion, and are fully described in Section 3.0 of 99-AFC-7 (Section 3.1.15) included in Attachment A to this application.

3.5 FACILITY CIVIL/STRUCTURAL FEATURES

This section describes the civil and structural features that will be added to the existing PEF in order to accommodate the PEF Expansion. These include the CTG, exhaust stack, and generator step-up transformer. These new features are shown on Figure 3.1-1 of this application.

The PEF Expansion shares common facilities with the existing PEF. The PEF Expansion will utilize the existing PEF administration and control, electrical control building, warehouse and shop, water storage, and water treatment buildings. Site access and onsite roads are common to the existing PEF. The PEF Expansion is fully within the existing PEF boundary, and thus the PEF onsite security system. A complete description of these shared common facilities from the Project Description Section of 99-AFC-7 is included in Attachment A, Project Description Materials, appended to this application

3.5.1 Power Block

The PEF Expansion will consist of one power block and associated auxiliary equipment. The power block will consist of one CTG, SCR, exhaust stack, and one generator step-up transformer. Corresponding auxiliary mechanical and electrical equipment will be located adjacent to the power block. The PEF Expansion power block is shown on Figure 3.1-1 of this application.

The CTG will be supported on a reinforced concrete foundation at grade. Individual reinforced concrete pads at grade will be used to support the BOP mechanical and electrical equipment. Foundation pilings will be used for major equipment and building foundations if required. All equipment will have seismic anchoring that meets or exceeds requirements for CBC Seismic Zone 4.

3.5.2 Exhaust Stack

The CTG will be provided with one self-supporting steel stack. The stack will be 22.75 feet diameter and 131 feet tall and will include associated appurtenances, such as sampling ports, exterior ladders and side step platforms.

3.5.3 Buildings

PEF Expansion will not require the addition of new buildings. All other buildings are part of the existing PEF as shown on Figure 3.1-1 and as described in Section 3.5.3 of 99-AFC-7 (included as Attachment A of this application).

3.5.4 Storage Tanks

The PEF Expansion includes no new storage tanks. All other tanks are included with the existing PEF and described in Section 3.5.4 of 99-AFC-7 included in Attachment A of this application. The existing tanks are shown on Figure 3.1-1 of this application.

3.5.5 Roads

The internal and access road network serving the PEF will also serve the PEF Expansion as shown on Figures 3.1-1, 3.1-4, 3.1-4A, and Figures 3.1-6 and 3.1-7 of 99-AFC-7 included in Attachment A of this application. The road network for the existing PEF is sufficient to meet the demand of the PEF Expansion.

3.5.6 Site Security

The PEF Expansion is located within the existing PEF boundary and will be covered the PEF onsite security system. Controlled access will be maintained at entrances to PEF secure areas consistent with the existing PEF.

3.5.7 Site Grading and Drainage

The PEF Expansion does not alter the site grading and drainage plan described in Section 3.5 of 99-AFC-7, which is included in Attachment A of this application. The PEF Expansion will be constructed on approximately two acres of the existing PEF site in an area reserved for this purpose.

3.5.8 Site Flood Issues

Site flood issues remain unchanged from the existing PEF. Refer to Section 3.5 of 99-AFC-7 included in Attachment A of this application for a description of the flood issues and solutions for the PEF site.

3.5.9 Sanitary Sewer System

PEF Expansion will use the existing PEF sanitary sewer system. Therefore, it will not be necessary to expand the underground sanitary sewer system beyond that already described in Section 3.5 of 99-AFC-7, included in Attachment A of this application.

3.5.10 Earthwork

The PEF Expansion does not alter the site grading plan described in Section 3.0 of 99-AFC-7, included in Attachment A to this application.

3.6 TRANSMISSION FACILITIES

The PEF Expansion shares common transmission facilities with the existing PEF. The existing PEF switchyard will accommodate the PEF Expansion with the addition of a 230 kV circuit breaker in one of the switchyard spare bays. The transmission line connecting the plant to SCE's system is already sized to carry the output of the PEF Expansion. A complete description of the shared transmission facilities is included in Attachment A, Project Description Materials, appended to this application.

3.6.1 Electrical Interconnection Points

The 230 kV transmission line for the existing PEF is a direct intertie between the PEF switchyard and SCE's Pastoria Substation. The existing 230 kV switchyard at SCE's Pastoria Substation is the point of interconnection for the project.

3.6.2 Transmission Line Specifications

There will be no change to the existing PEF 230 kV transmission line as a result of the PEF Expansion. The line connecting the plant to SCE's system is approximately 1.3 miles long. The line connecting the plant to SCE's system is already sized to carry the output of the PEF Expansion.

3.6.3 Transmission System Evaluation

SCE has performed a System Impact Study and a Facility Study under SCE's Transmission Owner's Tariff for the existing 750 MW PEF plant. The System Impact Study determined the impact on the SCE system based on power flows on the existing transmission lines and transformers, short circuit duties of the existing transmission facilities and stability of the interconnected system considering various contingencies and fault conditions. The Facility Study outlines mitigation measures for transmission facility overloads and the cost associated with the upgrading of the transmission facilities for the existing PEF. For the PEF Expansion, a new System Impact Study and Facility Study will be required and an application to perform these studies has been submitted to SCE. The System Impact Study and Facility Study will be submitted to the CEC under separate cover.

3.6.3.1 Transmission System Reliability Criteria

The North American Electric Reliability Council (NERC) and the Western System Coordinating Council (WSCC) Reliability Criteria for Transmission System Planning, the Independent System Operator (ISO) and the SCE Reliability Criteria, will be used in the evaluation of the interconnection of this facility to the transmission system. Additionally, SCE/ISO has special operating criteria for the southern California Area and for the local transmission system (Big Creek System) to which the facility is interconnected. These criteria will also be utilized in the analysis to insure minimum criteria requirements are adhered to and project objectives are met. The ISO processes will be monitored throughout the transmission system evaluation to insure that any changes to the criteria are considered.

3.6.3.2 Transmission System Interconnection Study

Preliminary analysis by SCE indicates that the proposed PEF Expansion can be interconnected to the SCE Pastoria 230 kV Substation. This additional generation will provide enhanced reliability to the SCE grid for the southern California Area.

3.6.3.3 Electric and Magnetic Fields

3.6.3.3.1 Generation of Electric and Magnetic Fields. Power lines, electrical wiring, electrical machinery and appliances all produce electric and magnetic fields, commonly referred to as EMF. The electric and magnetic fields produced by PEF Expansion power system have a frequency of 60 Hertz (Hz), meaning that the intensity and orientation of the field changes 60 times per second. This section addresses the estimates of the maximum possible electric and magnetic field strengths that will be produced by the PEF Expansion transmission facilities. These estimates are computed for a height of one meter above the ground and include the canceling effects of other electrical transmission lines existing along the proposed transmission line right of way.

When a conductor is energized, an electric field is formed around the conductor that is proportionate to the energization voltage. The strength of the electric field is independent of the current flowing through the conductor. When alternating current (AC) flows through a conductor, an alternating magnetic field is created around the conductor. Overhead AC transmission lines carry power over three conductors with currents and voltages that are 120 degrees out of phase with each other. The fields from these conductors tend to cancel out because of the phase difference. However, when a person stands on the right of way under a transmission line, one conductor is always significantly closer and will contribute a net uncanceled field at the person's location. The strength of the magnetic field depends on the current in the conductor, the geometry of the structures, the degree of cancellation from other conductors, and the distance from the conductors.

3.6.3.3.2 Line Loads for EMF Calculation. Maximum magnetic fields are produced when the maximum amount of electric load is flowing through the conductor. The EMF analysis in the existing PEF AFC utilized a maximum line loading based on 1,000 MW at a power factor of 90 percent. This analysis is included in Attachment A, Project Description Materials, of this application. This loading converts to approximately 2,790 amps per phase at 230 kV. Therefore, no further EMF calculation is needed for the PEF Expansion.

3.6.3.3.3 Calculation Methods. To estimate the maximum fields, calculations are performed at mid-span where the conductor is positioned at its lowest point between structures (the estimated maximum sag point). The magnetic fields are computed at one meter above ground. The BPA Corona and Fields Effects program was used to calculate the magnetic field strengths for the line. This program and others like it has been used to predict electric and magnetic field levels that have been confirmed by field measurements by numerous utilities.

All loads on all circuits on the same tower are assumed maximum and taken at normal plant operating conditions. The dimensions of the existing power lines were based on preliminary information received from SCE.

3.6.3.3.4 Electric Fields Along the Rights of Way. Calculated electric field strengths at the left and right edges of the proposed right of way, as derived from the structure configuration sketches and corresponding field strength graphs, are included in Attachment A of this application. Note that at the edge of 80 feet right of way from the centerline on the east side, the electric field level is approximately 0.06 kV/meter.

3.6.3.3.5 <u>Magnetic Fields Along the Rights of Way</u>. Calculated magnetic field values at the left and right edges of the proposed right of way, as derived from the structure configuration sketches and corresponding field strength graphs, are included in Attachment A of this application. Note that for maximum current flow, the magnetic field at the edge of 80 feet right of way from the centerline on the east side is approximately 15 mG. The magnetic field values are not impacted by the PEF Expansion.

3.7 PIPELINES

The PEF Expansion will share common facilities with the existing PEF. The PEF Expansion requires no modifications to the existing PEF offsite linear facilities (e.g. electric transmission line, fuel gas supply pipeline, and water supply line). A complete description of the shared common facilities is included in Attachment A, Project Description Materials, appended to this application.

3.7.1 Natural Gas Supply Line

The PEF Expansion will utilize the existing 14.01-mile 20-inch diameter natural gas fuel transmission pipeline connecting the existing PEF to the 42-inch diameter Kern River-Mojave transmission pipeline. Operating pressure of the line will be approximately 700 to 900 psig. The selected route and all attributes of the transmission pipeline are fully described in Section 3.0 of 99-AFC-7 included in Attachment A of this application. The route, as constructed (including several alignment changes approved by CEC license amendments) is shown on Figure 3.1-4.

3.7.2 Make-up Water Supply Pipeline

Make-up water will be obtained from the WRMWSD. PEF Expansion will utilize the same 24-inch diameter pipeline connected to Line 14-G used for the existing PEF. Refer to Attachments A and E of this application for detailed information on the water supply from the WRMWSD and Figures 3.1-4 for the location of the existing line.

3.8 PROJECT CONSTRUCTION

The engineering, procurement, and construction (EPC) activities for the existing PEF are nearing completion at this time and will be completed at the time that the PEF Expansion construction is initiated. The construction phase of the PEF Expansion will require approximately 12 months. The schedule begins when the Owner issues a notice to proceed to the contractors for the additional PEF Expansion scope of work and is completed when the PEF Expansion is commercially operational. A complete discussion of the existing PEF construction activities from Section 3.8 of 99-AFC-7 is included in Attachment A, Project Description Materials, of this application.

PEF Expansion construction activities include all work on the expansion area, switchyard and plant start-up. Interim sequential activities for PEF Expansion area work will include foundation construction, erection of major equipment and structures, installation of piping, electrical systems, control systems, and start-up/testing. Site preparation and offsite utilities were completed as part of the existing PEF construction and are not part of the PEF Expansion. Commencement of PEF Expansion commercial operations activities will then occur upon completion of construction.

The EPC schedule, which includes project milestone schedule engineering and construction activities, has been prepared for the PEF Expansion. The construction labor loading, construction equipment requirements, construction deliveries and land disturbed through construction, have all been prepared as well. These are illustrated in Tables 3.8-1, 3.8-2, 3.8-3, 3.8-4, and 3.8-5 of this application.

3.8.1 Power Plant Facility

3.8.1.1 Project Schedule and Workforce

The work for the PEF Expansion will be executed under the same or similar agreements entered into by the Owner for the existing PEF. Refer to Section 3.8 of 99-AFC-7 included as Attachment A to this application for a detailed description of the PEF construction activities.

The detailed work plans, logistical studies, project procedures, schedules and administrative control systems developed to perform, monitor, and control the PEF Expansion project and its implementation will all be prepared in accordance with the existing PEF CEC Conditions of Certification, the new CEC conditions for PEF Expansion, and other LORS. Occupational, Construction and Environmental Safety Programs, and Project Quality Programs prepared for the existing PEF will be extended to the PEF Expansion.

The general sequence of work will proceed as follows:

- Receipt of the PEF Expansion Final Decision from the CEC by the Owner and issuance of a notice to proceed to the contractors by the Owner
- Development of the project with preparation of the schedule incorporating items required by the CEC's Conditions of Certification
- Commencement of engineering and procurement activities

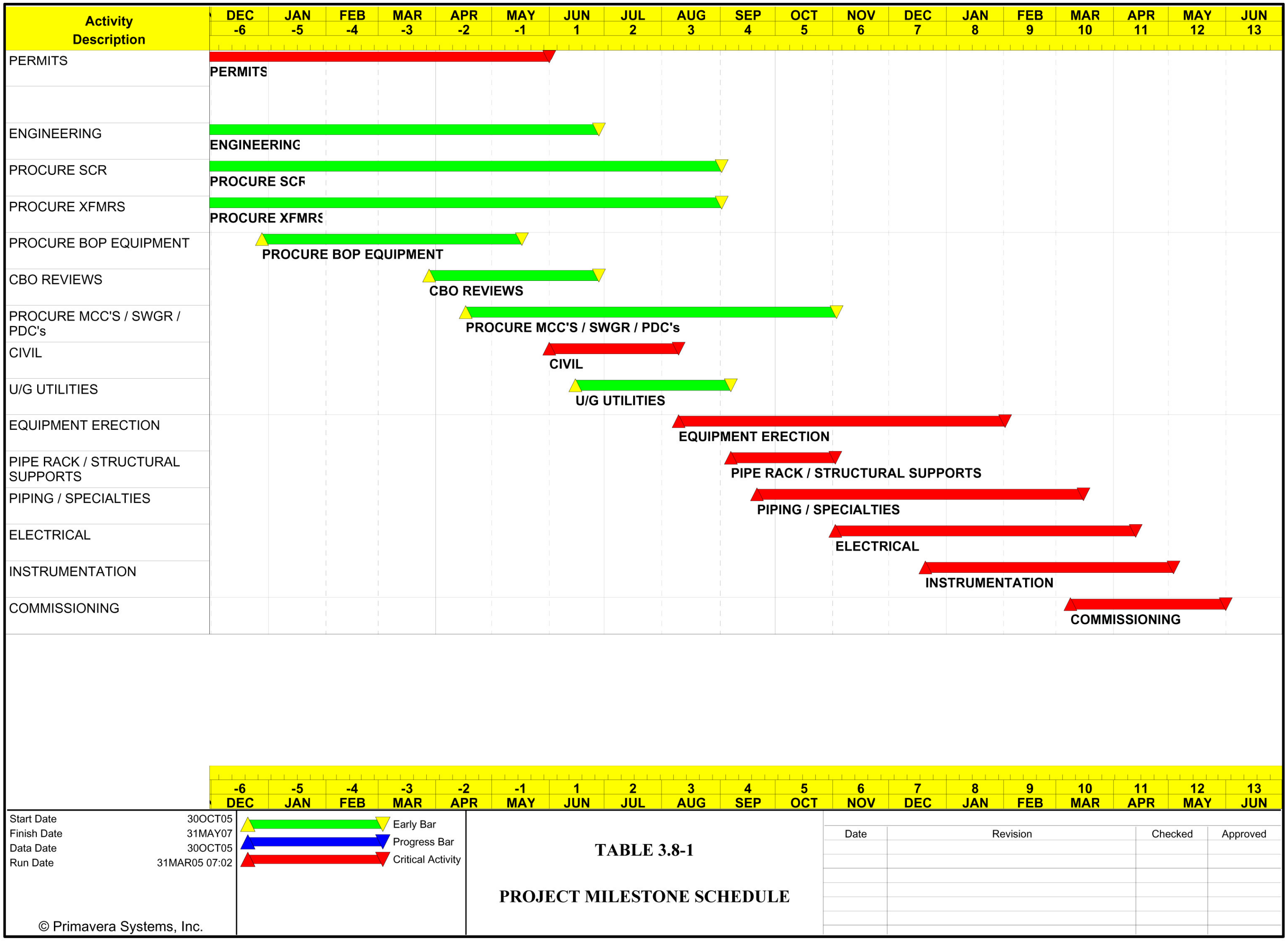


TABLE 3.8-1

PROJECT MILESTONE SCHEDULE

TABLE 3.8-2
PROJECT ENGINEERING AND CONSTRUCTION MANPOWER BY MONTH

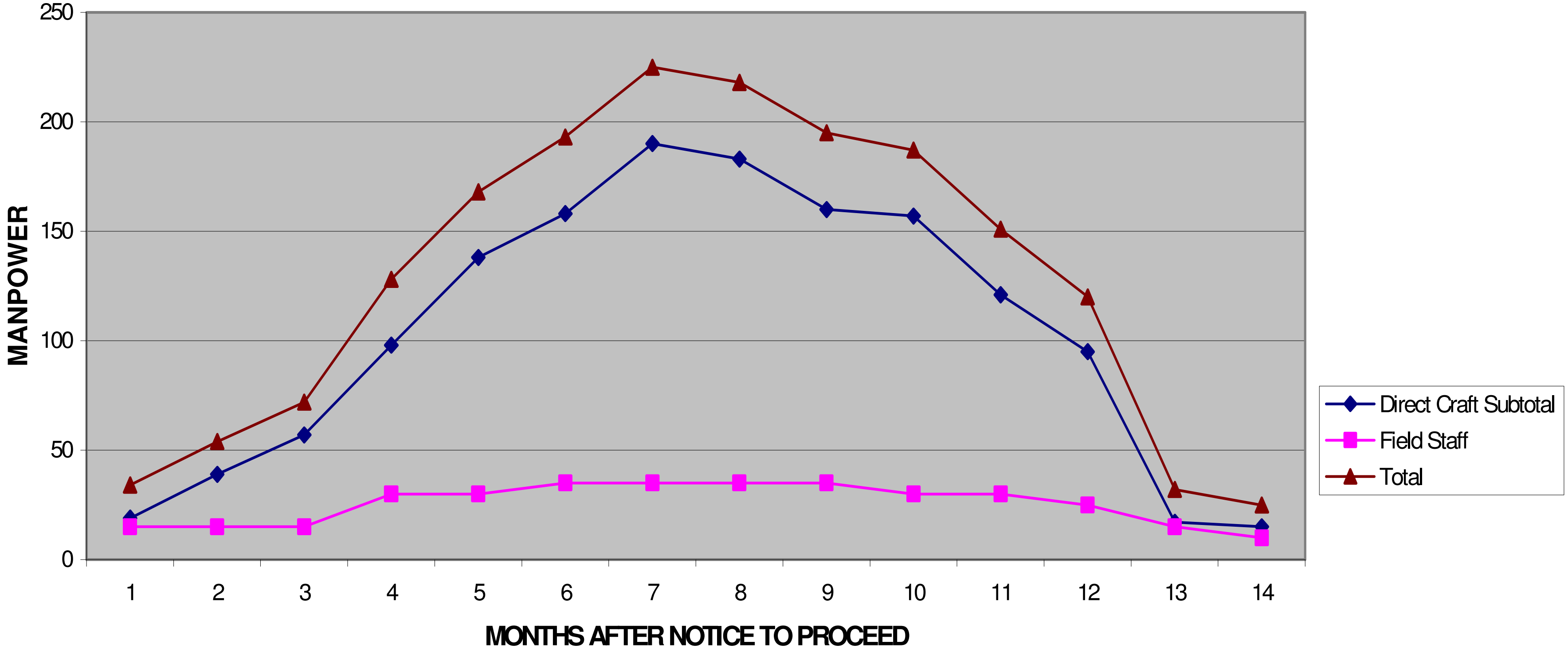


TABLE 3.8-3
PROJECT MANPOWER BY CRAFT

Resource Description	Months After Notice To Proceed														Man Months
	1	2	3	4	5	6	7	8	9	10	11	12	13[1]	14[1]	
	Manpower Per Month														
Carpenters	4	10	10	12	12	12	12	10	2	2					**86**
Cement Masons	5	5	7	10	10	10	10	7							**64**
Electricians		6	6	12	20	20	26	26	26	26	26	22	4	2	**222**
Insulation Workers							10	10	10	10	10	10	4	4	**68**
Ironworkers (rebar structural)	4	4	8	16	18	18	18	16	10	10					**122**
Laborers	3	5	10	16	22	26	26	26	26	26	22	16	4	4	**232**
Millwrights				6	6	8	12	12	12	10	8	2			**76**
Mech Equip Erection			6	6	16	22	26	26	26	26	20	12	2	2	**190**
Operating Engineers	2	2	2	2	4	4	6	6	4	4	2	2			**40**
Painters					8	10	12	12	12	12	10	10			**86**
Pipefitters		6	6	16	20	26	30	30	30	30	22	20	2	2	**240**
Teamsters	1	1	2	2	2	2	2	2	2	1	1	1	1	1	**21**
Direct Craft Subtotal	19	39	57	98	138	158	190	183	160	157	121	95	17	15	**1447**
Field Staff	15	15	15	30	30	35	35	35	35	30	30	25	15	10	**355**
Onsite Total	**34**	**54**	**72**	**128**	**168**	**193**	**225**	**218**	**195**	**187**	**151**	**120**	**32**	**25**	**1802**

[1] Months 13 and 14 represent demobilization and are therefore not considered as part of the 12-month construction schedule.

TABLE 3.8-4
CONSTRUCTION EQUIPMENT UTILIZATION – POWER PLANT SITE

Construction Equipment Description	HP	Construction Duration in Months/Equipment Pieces per Month														Total Piece Months
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Backhoe	150	1	2	2	2	2	1	1	1							**12**
Boom Truck	220		1	1	2	2	2	2	2	1	1	1	1			**16**
Cranes, 15 Ton	300			1	1	1	1	1	1	1	1	1				**9**
Cranes, 230 Ton	700				2	2	2	1	1							**8**
Cranes, 25 Ton	300		1	1	1	2	2	2	2	1	1					**13**
Dump Truck, 2 Ton	210	2	2	2	2	2	1	1								**12**
Excavator	195		1	1	1	1	1									**5**
Forklift, Cat V200	175	1	1	1	1	2	2	2	1	1	1					**13**
Manlift, 60 Ft.	30					2	2	2	2	2	2					**12**
Tandem Dump, 30 CY	250	1	1	1												**3**
Roller Compactors	100	1	1	1	1	1										**5**
Water Truck	225	1	1	1	1	1	1	1	1	1	1	1				**11**
Welding Machine, Portable	70		1	1	3	3	3	3	2	1	1	1				**19**
TOTAL		7	12	13	17	21	18	16	13	8	8	4	1			**138**

Construction Equipment Hours are based on 165 hours per month and 50% utilization.

* Based on 10% On-site Utilization.

TABLE 3.8-5
CONSTRUCTION TRUCK DELIVERIES OF EQUIPMENT AND MATERIALS

Resource Description	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Total**
Major Equipment															
Combustion Turbine Generator				4	6	6	4								20
Mechanical Equipment		4	6	6	4	4	4	4							32
Electrical Equipment and Materials	2	2	4	6	6	2	2	2	2						28
Piping, Supports and Valves					4	6	8	6	6	2					32
Miscellaneous Steel, Roofing and Siding				3	3	3									9
Construction Consumables	2	10	14	18	10	12	12	10	8	4	4				104
Construction Equipment	2	4	4	6	6	6	4	4	4	2	2				44
Concrete Pump Truck		1	1	1											3
Onsite Total	6	21	29	44	39	39	34	26	20	8	6				

- Installation of underground piping and electrical systems
- Construction of concrete foundations
- Installation of power-generating equipment
- Installation, interconnection, and testing of aboveground piping and electrical systems
- Installation, interconnection, and testing of instrumentation and control devices and distributed control system

Construction mobilization, construction of access roads, site preparation and construction of temporary facilities, including construction of the laydown area and parking lots, office complex and stormwater ponds to collect site runoff were all completed as part of the existing PEF construction and are not part of the PEF Expansion.

Construction will conclude with start-up and testing activities, which will continue until the entire facility is capable of reliable operation within permit requirements and good operating practice. All of the systems and subsystems in each unit will be tested and adjusted, first individually and then combined with others, before the PEF Expansion is deemed ready for startup.

The PEF Expansion will be declared commercially operational after successful completion of plant start-up activities, and after appropriate testing has been completed. Facility optimization activities may continue after commencement of commercial operation.

3.9 FACILITY OPERATIONS AND MAINTENANCE

This section discusses operations and maintenance of the PEF Expansion. PEF Expansion will be integrated into the existing PEF operations and maintenance programs. The PEF Expansion will share common auxiliary equipment and facilities with the existing PEF. These systems include fuel gas flow separator and metering facilities, water and wastewater treatment systems, including the Zero Liquid Discharge Wastewater Treatment System. A complete description of the PEF operations and maintenance (Section 3.9 of 99-AFC-7) is included in Attachment A, Project Description Related Materials, of this application.

The PEF Expansion will be integrated into the existing PEF distributed control system (DCS). The PEF Expansion DCS control consoles and the auxiliary control panels will be located in the existing PEF control room.

The PEF Expansion requires no modifications to the existing PEF offsite linear facilities (e.g., electric transmission, fuel gas line or water supply line) and therefore there are no changes to the operations and maintenance of these facilities.

3.9.1 Introduction

The PEF Expansion will be designed and operated to ensure safe, reliable, and environmentally acceptable operations per Title 20 CCR 1752 (c) for an operating life of 30 or more years.

The PEF Expansion is a simple cycle generating facility designed for the restructured California energy market. The facility incorporates an F-class combustion turbine generator (CTG) in a “1x0” configuration (i.e., one CTG and zero steam turbine generators). The plant design and operating philosophy will be based on operation in the competitive California electricity market, with a high emphasis on efficiency and flexibility.

The PEF Expansion will be integrated into the existing PEF operations staff. No additional employees will be needed for the PEF Expansion. The facility will be available for operation seven days per week, 24 hours per day. Plant operations will be controlled from the operator’s panel, which will be located in the existing PEF control room. A distributed control and information system will provide control, monitoring, and indication for plant functions, including startup, shutdown, load holding and following, and emergency annunciation and override.

3.9.2 Power Plant Facility

3.9.2.1 Plant Operation

The output of the PEF Expansion will be sold either through bilateral contracts or through the merchant market. Therefore, operation of the PEF Expansion depends on the quantity of electricity sold through contracts and the ability to sell into the merchant market.

3.9.2.1.1 Operating Modes. Electricity demand and availability fluctuate greatly, depending on weather and other factors. In response to market conditions, the PEF Expansion may operate in one or all of the following modes:

Base Load. The PEF Expansion will operate at maximum continuous output for as many hours per year as are profitable. This mode will require that the sum of contractual load and spot market sales equate to the base load output of the unit.

<u>Load Following</u>. The PEF Expansion will be operated to meet contractual load and whatever spot sales can be made. The output of the unit will be adjusted periodically to optimize the financial and operations value of this facility.

<u>Full Shutdown</u>. A full shutdown may occur if forced by equipment malfunction, fuel supply interruption, or transmission line disconnect. Full shutdown could also occur where the market price was less than the incremental cost of generation. Operation below maximum continuous output (base load) may be caused by economics and turbine operating characteristics. Gas turbine efficiency decreases sharply and emissions increase as output is decreased below 50 to 70 percent of CTG base load, depending on conditions and specific equipment characteristics.

3.9.2.1.2 <u>Annual Operating Practices</u>. The 160 MW PEF Expansion will generally be operated to provide maximum electrical output during the summer and winter peak periods when demand for electricity is the highest. The unit may be shut down or operated at partial load when reduced market demand makes full load operation uneconomical. When possible, planned maintenance outages will be scheduled during times of the year that typically experience the lowest electricity demand.

3.9.2.1.3 <u>Operation with Daily and Seasonal Variation in Temperature and Demand</u>. Peak electricity demand periods in California correspond with high air conditioning use on summer afternoons with high ambient temperatures. At the same time, available generating capacity is decreased because the high temperatures decrease airflow into combustion turbines and decrease cooling tower effectiveness for steam turbines. High temperatures also decrease transmission system capacity.

This PEF Expansion CTG unit will provide electricity needed to satisfy peak capacity and energy in Southern California and the state in general. In the latest energy forecasts for California, both the CEC and ISO have identified the ISO sp 15 demand zone as the most supply-challenged region in the state. The location of this peaking facility will help increase the supply reliability of this region.

To economically maximize output on hot days, an inlet air cooling system (fogging) will be installed on the CTG. The inlet cooling system will increase power and efficiency in many conditions down to or below 60^{o} F ambient temperature.

Depending on the market, a simple cycle plant could effectively operate approximately 95 percent of the year, although permitted use will be 8,760 hours per year. While this unit will be designed for maximum flexibility, the equipment is better suited for peaking service with a relatively low capacity factor.

When responding to electricity demand, the facility may start from zero baseline or may change incrementally from some level of output above minimum load. The “ramp rate” (the rate at which the unit will respond to a change in demand) is a function of the starting point and operating mode.

3.9.2.1.4 Startup and Shutdown. The time required for startup is dependent on the CTG manufacturer’s specifications. The unit will be capable of reaching full load in approximately 0.5 to 1.0 hours after startup from shutdown.

It is anticipated that approximately five to seven combustion turbine starts and stops per week (300 total starts/stops per year) will be made by the PEF Expansion unit.

3.9.2.2 Control Philosophy

The PEF Expansion control system will be integrated into the existing PEF state-of-the-art, integrated microprocessor-based DCS. The control system will provide for startup, shutdown, and control of unit operation limits, and shall provide protection for the equipment.

Interlock and logic systems will be provided via hardwired relays, the DCS, or programmable controllers. Process switches (i.e., pressure, temperature, level, etc.) used for protective functions will be connected directly to the DCS and the protective system.

3.9.2.3 Degree of Automation

The plant will be designed with a high degree of automation in order to reduce the number of procedures requiring intervention by operating personnel. Where it is not beneficial, systems will not be automated. Use of subsystem automation and a distributed control system will reduce the number of individual control switches and indicators and the complexity and size of the main control room consoles and panels that confront the operator. This modern, ergonomically based, control room design improves plant safety, reliability, and efficiency by simplifying operator actions and reducing opportunities for confusion when rapid response is needed.

3.9.2.4 Centralized Control

The majority of control consoles and input devices required to support the operation of the plant will be located in the existing PEF control room. The control room contains the DCS control consoles and the auxiliary control panels. In addition, the control room contains the alarm, utility, and log printers. Local control panels or stations will be furnished only where required to set up a system for operation, or where the equipment requires infrequent and non-urgent attention during plant operation. Main control room indication and control will only be duplicated for those variables critical to plant availability.

3.9.2.5 Distributive Control and Monitoring System (DCS)

The DCS will provide modulating control, digital control, monitoring, and indicating functions for the plant power block systems. The following functions will be provided:

- Control of the combustion turbine generator (via data link to CTG furnished control system), and other systems in a coordinated manner
- Control of the balance-of-plant systems in response to plant demands
- Monitoring of controlled plant equipment and controlled process parameters and providing this information to the plant operators
- Control displays (printed logs, cathode ray tubes [CRT] for signals generated within the system or received from input/output [I/O] points)
- Consolidated plant process status information through displays presented in a timely and meaningful manner
- Out-of-limit parameters or parameter trends will be automatically alarmed, displayed on the alarm CRT(s), and recorded on the alarm log printer
- Historical data storage and retrieval

The DCS will be a redundant microprocessor-based system and will consist of the following major components:

- CRT-based operator consoles
- Engineer work station
- Distributed processing units
- Input / output cabinets
- Historical data unit
- Printers
- Data links to the combustion turbine generator

The system will be designed with sufficient redundancy to preclude a single device failure from significantly impacting overall plant control and operations. This also allows critical control and safety systems to have redundancy of controls, as well as an interruptible power source.

3.9.2.6 Reliability and Availability

The PEF Expansion is expected to have an annual availability of approximately 95 percent, as is the overall combined 910 MW of existing PEF and PEF Expansion projects. It will be possible for the plant availability to exceed 98 percent for a given 12-month period. Plant design, operation, and maintenance will work together to provide this high plant reliability and availability.

3.9.2.6.1 Equipment Reliability and Redundancy. Where possible, control systems and auxiliary equipment serving the power generating and transmission equipment will be selected for high reliability. Where cost effective or necessary for safety, redundant equipment and systems will be installed to allow the plant to continue operating in the case of an auxiliary equipment failure. Table 3.4.1-1 of this application lists the plant's main generating components and major auxiliary equipment. Equipment redundancy is discussed further in Section 4.3.2 and illustrated in Table 4.3-1 of this application.

Reliability will be further ensured through a regular inspection and maintenance program. Outages will normally occur during times when regional electric demand is low and surplus generating capacity is readily available.

CTG inspections and overhauls will dictate the length and frequency of major scheduled outages. Under expected operating conditions, the CTG combustors and rotating sections will require a scheduled outage of one to two weeks. Every three to five years, major CTG overhauls will require scheduled outages which will last from three to 12 weeks. Major hot section overhauls will be required at about 25,000 equivalent fired hours and major overhauls of the complete turbine and compressor will be required at about 50,000 hours. Equivalent fired hours includes actual operating hours plus a factor for the number of starts. Experience with similar large frame-type CTGs indicates that the first major overhaul will be required during the third year of operation.

3.9.2.6.2 Personnel and Administration. Along with the plant hardware, plant administrative and operational procedures will be designed to enhance reliability. Plant operations and maintenance activities will be carried out in accordance with documented procedures and by personnel trained in accordance with a documented training program. To ensure operational efficiency, selected spare parts for plant equipment and machinery will be maintained onsite. The training program will include classroom and hands-on training. Plant operations and maintenance personnel will also participate in the commissioning, startup and test activities during the plant construction period.

3.9.2.6.3 Natural Gas Supply. Natural gas will be supplied through the existing PEF fuel gas supply pipeline.

3.9.2.6.4 Water Availability. Water will be provided to PEF Expansion through existing long-term contracts with WRMWSD negotiated during the existing PEF AFC process with the existing PEF entitlements.

3.9.3 Transmission System Operation and Maintenance

3.9.3.1 Introduction

Operation of the transmission system will be controlled using facilities at the existing PEF as well as the tie-in point at SCE's Pastoria Substation. Maintenance activities for the transmission system are described in the following sections.

3.9.3.2 Access Maintenance

Access ways to poles and structures are provided as required. All access ways are maintained to minimize erosion and to allow access by maintenance crews.

3.9.3.3 Right of Way Management

Land use activities within and adjacent to the transmission line right of way will be permitted within the terms of the easement. Incompatible uses of the right of way include buildings and tall trees that interfere with required line clearances, as well as storage of flammable materials, or other activities that compromise the safe operation of the transmission line.

3.9.3.4 Inspections

Transmission line structures, access ways, and right-of-way will be inspected on a routine, periodic basis.

3.9.3.5 Emergency/Safety Repairs

Emergency repairs will be made if the transmission line is damaged and requires immediate attention. Maintenance crews will use tools and other such equipment, as necessary, for repairing and maintaining insulators, conductors, structures, and access ways.

3.9.3.6 Insulator Washing

The buildup of particulate matter on the ceramic insulators supporting the conductors on electric transmission lines increases the potential for "flashovers", which affects the safe and reliable operation of the line. Structures with buildup of particulate matter are identified for washing during routine inspections of the lines. Washing operations consist of spraying insulators with deionized water through high-pressure equipment mounted on a truck.

3.10 FACILITY CLOSURE

Facility closure can be either temporary or permanent. Facility closure can result from two circumstances: 1) the facility is closed suddenly and/or unexpectedly due to unplanned circumstances, such as a natural disaster or other unexpected event (e.g., a temporary shortage of facility fuel); or 2) the facility is closed in a planned, orderly manner, such as at the end of its useful economic or mechanical life or due to gradual obsolescence. The two types of closure are discussed in the following sections. This discussion is consistent with the facility closure Section 3.10 of 99-AFC-7, included in Attachment A to this application.

3.10.1 Temporary Closure

Temporary or unplanned closure can result from a number of unforeseen circumstances, ranging from natural disaster to economic forces. For a short term unplanned closure, where there is no facility damage resulting in a hazardous substance release, the facility would be kept "as is", ready to re-start operating when the unplanned closure event is rectified or ceases to restrict operations.

In the event that there is a possibility of a hazardous substances release, the PEF Expansion compliance representative will notify the CEC compliance unit and follow emergency plans that are appropriate to the emergency, such as the Risk Management Plan (RMP). Depending upon the expected duration of the shutdown, chemicals may be drained from the storage tanks and other equipment. All wastes (hazardous and non-hazardous) will be disposed of according to LORS in effect at the time of the closure. Facility security will be retained so that the facility is secure from trespassers.

3.10.2 Permanent Closure

The planned life of the PEF Expansion is 30 or more years. If the facility were economically viable at the end of the 30-year operating period, it could continue to operate for a much longer period of time. As power plant operators continuously upgrade their generation equipment, and maintain the equipment up to industry standards, there is every expectation that the generation facility will have value beyond its planned life.

3.10.3 Closure Mitigation

At the time of facility closure, decommissioning will be completed in a manner that: 1) protects the health and safety of the public; and, 2) is environmentally acceptable. One year prior to a planned closure, the Applicant will submit a specific decommissioning plan that will include the following:

- Identification, discussion, and scheduling of the proposed decommissioning activities to include the power plant, applicable transmission lines, and other pertinent facilities constructed as part of the project.
- Description of the measures to be taken that will ensure the safe shutdown and decommissioning of all equipment, including the draining and cleaning of all tankage, and the removal of any hazardous waste.
- Identification of all applicable laws, ordinances, regulations, and standards (LORS) in effect at the time, and how the specific decommissioning will be accomplished in accordance with the LORS.
- Specify notification of federal, state, and local agencies, including the CEC.
- Once land is used for industrial or commercial purposes, it rarely reverts back to its natural state. Reuse of the land will be encouraged in this case, as opposed to taking additional land for future industrial or commercial purposes. If the plant site is to return to its natural state, the specific decommissioning plan will include discussion covering the removal of all aboveground and underground objects and material, and an erosion control plan that is consistent with sound land management practices. The plan will also require revegetation of the site with Tejon Ranch approved seed mix.

In the event of an unplanned closure, due to earthquake damage or other circumstances, the Applicant will meet with the CEC and local agencies and submit a detailed decommissioning closure plan in a timely manner.

No decommissioning plan will be submitted for a temporary shutdown.